

# COMPUTERWORLD

## THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Chicago, Illinois

Vol. III, No. 52

Dec. 31, 1969 Jan. 7, 1970

Price \$9/year



### Dirty Weather Help

A computer-aided project at Parks College of Aeronautical Technology of Saint Louis University is helping researchers discover how best to train private pilots for bad weather flying. Many accidents occur when pilots encounter bad weather and lose the instrument skills to fly out of it. The school uses an IBM 1130 to help determine how long after certification pilots begin to lose instrumentation flying abilities, and from these studies will recommend what recurrent training is needed.

## T/S Firms Cut Offices, Computers

By Drake Lundell

CW West Coast Bureau

NEW YORK — "The shakeout of the time-sharing business isn't impending, it's already here," one industry source said last week as *Computerworld* continued its investigation into the extent of the troubles in the industry and the probable effect on time-sharing users.

Initial indications of trouble caused by over optimism and lagging sales among some of the leaders in the time-sharing indus-

try (ITT Data Services, General Electric's Information Services Division, DIT & C) were reported in *Computerworld* Dec. 24.

But the troubles run deeper and now seem to touch on the entire business.

In addition to problems reported by ITT Data Services' West Coast operation (CW, Dec. 24), the firm's East Coast operation is also retrenching. *Computerworld* has learned. Presently, the ITT unit has closed its computer facilities in Princeton, N.J., and

at Broad Street in New York City.

Both of the closed offices were equipped with IBM 360/30 computer systems, which will now either be returned to IBM, or transferred to other segments of ITT. The Broad Street office is being consolidated with the firm's other New York City data center on Madison Avenue, while the Princeton operation will now be handled from Paramus, N.J., the headquarters for

(Continued on Page 4)

## Congress Warned on Two Proposed Giant Data Banks

By a CW Staff Writer

WASHINGTON, DC — "Individual dossiers on 33 million Americans will be prepared and housed in federal computers if two new data banks are approved by Congress," warned Rep. James E. Betts of Ohio.

The data banks "are integral but little-noted parts of the Family Assistance Act of 1969 and the Manpower Training Act of 1969 now in formative stages of consideration by House and Senate committees," he declared Rep. Betts. "There is no provi-

sion in either bill to protect the privacy of citizens whose personal histories will be in these dossier centers," he charged.

Although most of the dossiers already exist on the state level, Betts is particularly concerned that they will be centralized in government computers in Washington for the first time. He is also concerned about the probability that for the first time the data banks will be tied together.

### Welfare Recipient Files

The Family Assistance Act of President Nixon's plan for a minimum annual income. One provision would require that the Social Security Administration build up a data bank to determine individual eligibility. In effect, records now maintained by state welfare departments would be centralized in the Social

Security administration computers.

Betts noted that the Social Security Administration would make these dossiers available to state welfare offices, which would follow state procedures on privacy. "So we would have 50 different levels of confidentiality," he said.

### Job Bank

The national Manpower Framing Act calls for the establishment of a national job bank and for computer matching of jobs and workers.

"Once operational," Betts declared, "anyone registering with a public employment service office would find a detailed personal file of facts about him, his financial situation, and complete job experience record linked to a national network of companies."

According to Betts, the system

coming through here recently for jobs but we aren't cutting back. In fact, Nov. 1 we opened an office in Boston and Dec. 1 we opened one in Oakland, Calif."

Arthur Speckhard, president of Interdata Industries Inc., a time-share, remote batch company that also offers full software and facilities management services, as well as its own line of hardware terminals, said, "For success in this field you can't be in a position where you are dependent upon the technological base of the mainframe manufacturer

or anyone else. You have to be able to build up service and products with skills, not just make something that's existing available. Then you can be

**Computerworld's Review of 1969 begins on Page 11 and continues on Pages 12-14.**

priced out of it."

Intranet has invested some \$1 million in developing its own time-share software and hard-

(Continued on Page 4)

## Honeywell to Market UCC Remote Batch 1108s Time

By Drake Lundell

CW New York Bureau

NEW YORK — Honeywell's service bureau and time-sharing unit, the Information Services Division, is now offering remote batch processing on Univac 1108 computers operated by University Computing Co. Although Information Services Vice-President Claude Smith told *Computerworld* that there was no definite agreement with UCC, University Computing spokesmen admitted, "we have a contract with Honeywell for use of our 1108s." In addition, Honeywell salesmen here are offering the service to potential customers and have already signed contracts with some.

Using the Honeywell Remote

Access Service, a user's computer can be attached to the 1108 system allowing the remote system to access the 1108. Editing will be done by the customer's hardware.

Honeywell sources indicate that a large spectrum of hardware can be used with this service, including IBM, RCA, and Honeywell equipment.

According to Honeywell sources, the firm is using the UCC 1108s to gain a quick entry into the remote batch scientific processing field. It might take a year or two for Honeywell to offer comparable service on its own equipment, a spokesman said.

In addition, the Information Services Division is supplying time-sharing on the Honeywell 1648 system and it hopes to be able to offer commercial remote batch service on the Honeywell 3200 early next year.

The Mod 4 software system for the 3200, which will allow remote batch service, is still in the experimental stage.

(Continued on Page 4)

### On the Inside

IBM System/3 Users Won't Save Money

— Page 2

Computer's Role Not To Replace Management

— Page 6

Business, Industry ..... 27  
Editorials ..... 8  
Education ..... 25  
Financial ..... 41  
Software ..... 19  
Societies ..... 26  
Systems/Peripherals ..... 12

### Notice to Subscribers

This is *Computerworld's* special year-end combined issue. The next issue will be dated January 14 and should reach subscribers around Jan. 12.

## System/3, Part III: Costs Compared

# Prospective Users Don't Plan to Save Money

By Frank Pianta  
cws staff writer

Unit-record users say they are not saving money by going to System/3.

Installation managers know that the new system will cost more; but they justify the cost increase by pointing to new applications that previously were impossible with unit-record equipment.

These new users, however, may not realize just how much more it will cost.

### Paralleled Run

Tab managers, in a recent survey, told CW that they were planning to allow from six months to a year of parallel operation to convert to the new system.

A surprising number of installations, moreover, are going to try to make the conversion in one month or less.

These users justify their position based on three factors: time, space, and money.

The shipping dates given them by IBM have been so distant, as long as 21 months in some cases, that many managers have come to the conclusion that they can do all of their program testing and the bulk of their file conversion before the new system arrives to make maximum use of this lead time.

### Space Tight

Characteristically, they report that the machine room is crowded. With tabulators, reproducers, and calculators, tied together by serpentine, gray cables, with interpreters, collators, sorters and card racks crowding the corners, with operators vying for the floor space with card-boxes and stacks of forms, the harried tab manager can't picture himself making room, in addition, for a computer and a unique set of peripheral equipment.

The manager's third consideration is money. To do everything there, in parallel operation, costs money.

Labor costs go up, supply costs go up, and machine costs for two complete systems go way up.

There might not be enough

time or enough money available, however, to make System/3, or for that matter any computer upgrade, work.

Long lead time would be very advantageous if it meant a corresponding increase in computer time available for testing. There are definite limits on the number of test hours available from IBM and the large number of systems on order indicate tight scheduling of test time.

### IBM Centers

On the subject of the facilities that IBM will make available to their System/3 users, a spokesman for IBM said that there were currently 54 basic system centers in operation.

Although he refused to speculate on the ultimate number of centers that might be established, he said that IBM is basing the number of systems on the needs of its customers.

However, he did state that 40 of the basic system centers will have conversion equipment installed by June, 1970. All of the centers will be so equipped by the end of January, 1971.

The spokesman indicated that resources will vary from center to center, depending on geographical location and the number of customers in the area. Three categories of system centers are scheduled to be established, large, medium, and small.

The large centers, which will at first be located in major cities, will be equipped with at least three System/3s, a 360/20, an 1130, a 6400 accounting machine, and unit-record equipment.

The medium center will have all of the above, except that the System/3 will be available. The small center will have one System/3 and unit-record equipment.

Exact configurations will vary from location to location depending on local conditions. But each center will be equipped for testing, conversion, and training, with an IBM technical staff available to the user for consultation.

The new hardware will probably arrive with the programs in-

sufficiently tested and with the total software system having survived only a cursory shakedown, some sources say.

### Dangers Possible

The cost of a full parallel run is high, but the danger inherent in putting into live operation an untried system is apparent to the experienced observer. The savings could become a negative value if a serious system bug caused extensive reruns. A full month's work, or more, might have to be reconstructed.

Inexperienced personnel are most likely to cause this type of error, and most System/3 problems will be programmed by inexperienced personnel.

### Programming?

CW spoke to a cross section of prospective users and found that the typical installation manager is planning to do his own programming. "I've been wiring all of my own boards," is the extent of programming experience indicated by most.

The user knows his tab-card installation, but is this really sufficient? Yet, most managers say they are not going to use any more of the systems support offered by IBM than they have to. Cost is the primary reason for this reluctance. When asked by CW if his firm was going to IBM for system help, the data processing manager for a small midwestern manufacturer answered, "Yes, but not as much as we would have if it were cheaper." Similar feelings were expressed by most of the other users contacted.

### Hardware Costs Up

System/3 hardware is the most obvious item in the list of increased costs. After speaking with many small users-to-be, CW found that the increase in rental costs over their tab equipment range from \$200 to over \$1,000 per month, averaging \$550.

This might not sound very high to some, but when it represents an increase of 25% to 50% or more of the hardware budget, it is very serious for small companies.

Tab equipment is limited in the type and number of applications, but it is cheaper than System/3. A small installation equipped with the basic models of the necessary machines could be leased for under \$700 per month.

This would include: sorter, collator, reproducer, tabulator, calculator, keypunch and verifier. If more powerfully equipped models of the above equipment were selected, the price would still be under \$1,200 per month, which is the price of a card-oriented System/3, with minimum configuration.

CW's study indicated that most of the installations contacted were paying only minimal overtime charges amounting to 50% of the regular leasing hourly rate. It eliminates one of the real dollars and cents justifications for the faster computer system.

### New Applications

To justify the acquisition of a System/3, most users cited the new applications possible at a modest increase in cost. After listing a half-dozen systems he intended to implement, the manager for a small insurance company said, "We could have done most of these on our current equipment, but we could never afford the time."

The new applications cited ranged from the routine applications: accounts payable, accounts receivable, and payroll to the more exotic areas of dynamic scheduling of machines and manpower, and various analytical runs with an emphasis on

exception reporting.

### Payroll Not Affected

Personnel costs, if current plans prevail, will not be affected significantly. Tab operators will be retained to operate the System/3, while the programming will be done by the installation manager.

The managers felt, almost without exception, that unless their system was significantly expanded, they would be able to design and implement their new systems with a minimum of help.

The DP manager for a furniture company said, "If we get bigger and go to a disk system, that will be something else. Then we might have to get a programmer... I've been wiring all the boards myself until now, but if we get bigger, I won't be able to do it."

This approach was tried before. With the advent of the 1401, many installations tried to use the same approach, with mixed results, mostly bad.

It might be advisable for the potential System/3 users to get together with their more experienced colleagues. They could come away with a more realistic view of the problems they will face.

**SUBSCRIBE  
TO  
COMPUTERWORLD**

**WANTED  
IBM 360's**

**ALL MODELS  
AND COMPONENTS**

**Prompt replies to your  
offerings. Call collect  
or write:**

**gsm**

**For Lease  
Teletype  
Model 33ASR  
From RCA**

**Available immediately—  
includes nationwide  
maintenance service.**

Call or write  
RCA Technical Products Service  
RCA Service Co.  
A Division of RCA  
Bldg. CHC 225  
Camden, N. J. 08101  
Phone: (608) 983-8000  
Ext. PH-3311

**RCA**

**DISK PACKS  
FOR SALE OR LEASE**

- Up to 40% discount on new brand name packs.
- Guaranteed error free, i.e., no flag tracks.
- Low lease commitments as short as six months.
- Also: trade-up options, purchase option credits, drive protection warranty, nationwide maintenance force, immediate delivery, and free replacement filters.
- Will purchase installed packs for lease-back.

### INQUIRY ADDRESS:

Data Funding, Inc.  
P.O. Box 1223  
Pittsburgh, Pa. 15220  
Attn: Neil L. Houghton, President  
PHONE: (412) 381-8340

• Sales Representatives Solicited.

**DATA  
COMMUNICATION  
IDEAS?**

### Talk to Tally

How about a low cost computer compatible mag tape terminal? Tally's got the answer: the Model 4031 Magnetic Tape Send/Receive Terminal. Using 1/2" tape, this system independently sends or receives data with any other Tally terminal, freeing the computer from time consuming transmission tasks. Select 200, 500, or 800 cpi. Features unattended streaming and automatic error correction.

Write or call Tally, 1519 Shorser Street, Seattle, Washington 98108. Phone: 325-634-4760.

**POSTMASTER: CHANGE OF  
ADDRESS FORM 3579 to be  
sent to Computerworld, Circula-  
tion Dept., 737 Washington, New-  
ton, Mass. 02180.**

Computerworld would like to extend you an invitation to attend COMPSO EAST, The First Regional Computer Software Peripherals Show and Conference.

At the New York Hilton, New York City January 19-21, 1970.

We feel that you will find the exhibits and conferences interesting and informative.

While you're there... be sure and stop by our booth (#1,2,3), say hello, and help yourself to a copy of our latest weekly issue.

Dave Trisko of  
NCI Chicago tells how

## **"WORK TEN brings segmented logic to all programmers"**

"Only a few experienced programming pros even know of segmented logic. Yet it means simpler and more efficient programs. No unnecessary looping and branching. Faster analysis of systems. And more. Much more.

"WORK TEN, the new computer language brings segmented logic to all your programmers regardless of their experience. And makes it fast and easy for them. WORK TEN divides every program into the logical segments common to all commercial data processing. These are the specific times within any program where certain actions occur.

"Your analyst can use special work sheets to outline program functions according to the segment in which they occur. Most of the time, this leap-frogs the need for detailed flow charts. Your programmer then takes these program functions and codes them in WORK TEN by segment.

"WORK TEN automatically produces all mechanical phases of the program in perfect COBOL. Each individual routine is machine generated using the optimum code to perform that function. There is no waste. Your programmer needs to hand code only the 10% to 20% of the program that is creative.

"Get the facts on how WORK TEN with segmented logic, automatic COBOL generation, and automatic narrative documentation can work for you. Write for more information. Now, before you turn the page."

NATIONAL COMPUTING INDUSTRIES  
3003 NORTH CENTRAL AVENUE  
PHOENIX, ARIZONA 85012  
TELEPHONE 602: 264-1394



# Time-Share Firms Cut Offices, Computers, Services

(Continued from Page 1)  
ITT's time-sharing operations.

In addition, ITT Data Services has closed its Programming Service Division's sales office in New York and consolidated it with the operation in Madison Avenue. ITT would not comment on reports circulating of other shutdowns, but did say "the situation is being reviewed, and, if it seems to be consistent with good business practices, other offices will be closed."

ITT, like all of the firms in the time-sharing field, refuses to divulge employment statistics, but *Computerworld* learned that after the recent 10% cut in personnel, divisional employment at the end of 1969 will be at approximately the same level as at the end of 1968.

In comparison to ITT's seem-

ing lack of personnel growth, GE reported that overall employment in its Information Services Division was up 30% over last year - even after accounting for the recent personnel reduction that was estimated at as much as 20% of the divisional employees.

Another firm currently experiencing some difficulties in the personnel field is Honeywell's Information Services Division. *Computerworld* learned that present the division has placed a freeze on new employment, and some sources say it is not replacing personnel that have left the firm.

## Honeywell Freeze

Honeywell spokesmen said the manpower freeze is only a "temporary measure" and "should the manpower buildup" should

be back on schedule by the first of the year. The spokesman refused to say how long the manpower ceiling has been in effect, but some sources said hiring stopped before October. The Information Services Division is reportedly the only Honeywell unit with a manpower freeze at the present time.

In other areas, Honeywell claims that it is on schedule. The firm had announced plans to open 10 East Coast offices in the first 18 months of business and opened six during 1969. The other offices "will be opened on schedule," the spokesman said. Computers delivered at the 1648 time-sharing computer were behind schedule were also categorically denied.

(Computer Network Corp. (CNC)) is also going through

a period of "readjustment to meet present market conditions." CW discovered. The Washington, D.C.-based firm has already closed two recently opened computer centers, one in Bala Cynwyd, Pa., and the other in East Orange, N.J.

CNC is presently maintaining its sales offices in the two areas and handling New York City and Philadelphia customers through its Washington headquarters. The two Burroughs 5500 systems that were located at the now closed centers have been sublet, a CNC spokesman said.

CNC, like GE [CW, Dec. 24], said that business was down during the past year. The office closings, CNC said, were a simple cost-cutting move to boost its profit margin. Also like GE, the firm admitted that it had misjudged the rate of growth for new segments of the industry.

CNC, which predicted a bright financial future for itself during its initial period of readjustment, admitted that the new computer services offering raw time without support had cut into its business. Many of these firms, spokesmen said, have come in with sub-par prices which have drained some customers away from other services.

However, CNC said, these "cheap" services are only hurting themselves in the long run, because they will not be able to

capture a significant share of the market without developing a line of applications packages and offering more support than at present.

In addition to problems reported by these relatively established firms in the time-sharing market, many of the newer time-sharing companies are also suffering from present market conditions, reports circulating here indicate.

## Smaller Firms Troubled

Some of these smaller firms are reportedly having a great deal of trouble finding financing - either through public offerings or through private placements, one source said. Many of the privately held firms have received support from the mutual funds in the past, he said; but with the market on a downward slide, the mutuals are taking a closer look at all of their speculative ventures.

The effect of the shakeout on the user is hard to determine at the present and could go either way depending on the user's level of sophistication.

Overall the future looks bright, but not as bright as at this time last year. The \$1.5 to \$2 billion remote computing market predicted for 1975 has probably been put off a year or 18 months, according to GE's Paul Sage, but, as one of his competitors said, "Any company that can survive the next two years is on the gravy train."

## Honeywell to Market UCC Time on 1108s

(Continued from Page 1)

A product of Honeywell's Computer Control Division, the 1648 is now used as a dedicated time-sharing system. It typically consists of two 32K Model 516 processors using a Model 516 solving one 4K 416 processor handling the communications, two disk controllers, and four or five disk drives. In addition, VDU readers, line printers and other peripherals are attached as required.

## 1648 Non-Remote

The 1648 - the key to Honeywell's time-sharing operation - does not permit remote job entry, Honeywell said.

Even though Honeywell spokesmen told *Computerworld* that the agreement with University Computing was a national arrangement, at present details are available only on the New York City operation, which was established last July.

The New York office has yet to install its own 1648 and is now linked to a 1648 in Boston, as is the Honeywell Washington, D.C., time-sharing operation.

By early next year, Honeywell spokesmen said, the New York office will be operating on its own 1648, in addition to at least one Honeywell 200 and, hope-

fully, a 3200.

When the New York 1648 is installed, it will be interconnected into one of the ports on the University Computing 1108 in East Brunswick, N.J., Honeywell sources said.

When a Honeywell time-sharing customer needs the power of the 1108 for a large job, data can then be entered directly from his terminal through the 1648, thus allowing the 1108 to interact with the customer's file stored in the 1648.

Printout from the job, which would then be handled on a remote batch basis by the 1108, could then be entered at the user's terminal, at the 1648 site equipped with a variety of printers, or at the Honeywell service bureau in downtown Manhattan.

## Large Time User

A Honeywell spokesman said that the agreement with UCC was an "almost natural" extension of other agreements between the two firms. Honeywell, he said, is a large user of UCC 1108 time in its Aerospace Division, and when the decision was made to enter the remote batch scientific field as soon as possible, the deal with UCC was arranged.

The agreement with UCC should help Honeywell beef up

both its time-sharing and remote job entry business, Honeywell sources said. Presently, in New York, time-sharing accounts for about 20% of the Information Services Division's revenue and remote job entry around 30%. The main source of revenue is contract programming, which amounts to 40% of present sales. The remaining 10% is attributed to classical service bureau business, according to a Honeywell spokesman.

## Price Increases Seen for T/S Industry

(Continued from Page 1)  
ware configuration based on the Unibac 1108.

It is to network the system using local area laient and capital financing.

"Networks are not a growth element," commented Speckhard. "They're essential. The plateau of profit is high and getting higher all the time. You can't have only one center. It is why there is the emphasis on networks and why only the big ones will survive."

GE has recently raised its standard service bureau prices 10% and IBM's Service Bureau

Corp. upped time-share services prices an average of 14%.

Ronald F. Morrison, president of Booth Resources International and a former director of IBM's blue ribbon Hundred Percent Club, said that a company that just offers raw machine time is too vulnerable to price-cutting.

"Our concept is to work with the customer, to bring his entire data processing requirements into our house."

1970 is already shaping up as the shakeout year for the service bureaus.

Industry experts have predicted

ed it as being a fast and brutal process. It appears to be underway at this time.

This shakeout comes at a time when unbundling is expected to release vast new sums for software and machine services by private companies. Undaunted by the current upheavals in the industry, Computer Sciences Corp. is expected to announce its time-share network as operational in February.

The service, Infranet, represents what industry sources estimate to be a multimillion dollar investment in development costs alone.



## COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BAYT AUSTIN STREET, NEWTON, MASSACHUSETTS 02459 • TELEPHONE (617) 552-0008

TM REG. U.S. Pat. Off.  
POSTMASTER: CHANGE OF ADDRESS FORM 3579 to be sent to *Computerworld*, Circulation Dept., 787 Washington, Newton, Mass. 02460.  
Weekly Newspaper-Second Class Postage Paid at Chicago, Ill. Published every Wednesday by *Computerworld, Inc.*, 25 E. Chestnut, Chicago, Ill. 60611. Send all editorial and subscription material to *Computerworld*, 787 Washington St., Newton, Mass. 02460. (617) 332-5606; TWX-710-335-6625. © 1970 by *Computerworld, Inc.*

Robert M. Patterson, Executive Editor: Neal Wilder, National Sales Manager; Margaret Phelan, Circulation Manager; Henry Fling, Art Services Supervisor; Mary Upton, Typesetting Services Supervisor.

W. Walter Boyd, Publication Manager; Patrick J. McGovern, Publisher. Subscription rates are \$9 for one year, \$20 for three years. Add \$1 per year for Canada; \$4.50 per year for Europe. Foreign air mail rate available on request.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests for permission to the Publication Manager.

BPA Membership Applied For



## COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BAYT AUSTIN STREET, NEWTON, MASSACHUSETTS 02459 • TELEPHONE (617) 552-0008

Yes, please send me *COMPUTERWORLD* for:

☐ 1 Year \$9.00  
☐ 3 Years \$20.00 ☐ Bill Me

☐ Payment Enclosed

Name																	
Your Title	49																
Co.	57																
Name	18																
Address																	
City	38																
Zip	2	6	7	8	15	16	17	18	19	20	21	22	23	24	25	26	27
Code		CW															

Return to:  
COMPUTERWORLD 60 Austin Street, Newton, Mass. 02460

Please Circle 1-Number  
and 1-Letter:  
YOUR TITLE AND/OR  
FUNCTION?

- A. Operational Management (non-engineering)
- B. Computer Professional Staff
- C. Corporate Officers
- D. Engineering Management
- E. Engineering/Scientific
- F. Production/Maintenance
- G. Sales/Marketing
- H. Other

## COMPANY BUSINESS:

- 1. Mining or Construction
- 2. Manufacturing/Computer or Data System
- 3. Manufacturer/Other
- 4. Utility
- 5. Wholesale/Retail
- 6. Finance
- 7. Consultants/DP Services
- 8. Business Service (except DP)
- 9. Educational/Medical/Legal
- 10. Government/Military
- 11. Other

# Fair Credit Reporting Bill Now Awaiting House Action

WASHINGTON, D.C. - No action is expected on Sen. William Proxmire's Fair Credit Reporting Bill until well into 1970.

The bill passed the Senate Nov. 6 and is now waiting for action by the Subcommittee on Consumer Affairs of the House Banking and Currency Committee. The Proxmire bill would be an amendment to the Consumer Credit Protection Act which was written by Subcommittee Chairman Leonor K. Sullivan (D-Mo.). Committee staff aide Charles Holstein said that Miss Sullivan "is very much in sympathy with the ideas contained in the proposal." But he also noted that she recently said that she was opposed to expanding the Consumer Credit Protection Act until it is working correctly. Holstein said that Miss Sullivan has not

had time to consider the bill yet, but that "representatives of the consumer credit reporting industry have already come to her to say that they can live with the current bill. They are afraid that she might expand it and make it stronger the way she did with the Consumer Credit Protection Act."

## New York Also Acts

Proposals to regulate credit bureaus are also being made on the state level. A bill has been filed with the New York state legislature nearly identical to one that was passed in Massachusetts this year. The bill would require that if an individual is denied credit, wholly or partly because of a credit bureau report, the person must be told of that fact and be given the name and address of the credit

reporting agency making the report.

## Credit Bureau Computerizing

When he originally proposed his Fair Credit Reporting Bill, Proxmire noted that he was particularly concerned about

the growing computerization of credit bureaus. He warned that in addition to freezing in errors already in the files, computerization would probably add more errors due to bugs that enter during the conversion period.

# Official Denies Pro-IBM Bias Is Delaying CCD's Computer Choice

DENVER, Colo. - A state official has denied that any pro-IBM bias is causing delays in selecting a computer for Community College of Denver.

The official, who did not wish to be identified, said that there might be some bias for the corporate giant, but that it would be "coincidental" to selection of ADP equipment.

The official was commenting on bias charges made by CCD students who face the distinct possibility of graduating from a two-year data processing course without ever seeing a computer (CW, Dec. 10).

The students claim that irregularities have occurred favoring IBM, and they cite for evidence the fact that virtually every state school with administrative capabilities is equipped with an IBM computer. They charge that has is causing delays for "re-evaluation" of proposed systems. State officials admit that evaluations are not objective, and that low bidders do not always get contract awards.

A new state policy requires that all vendors be informed of upcoming purchases, and the state says that resultant communication needs are causing the delays.

The students disagree. They say that faculty and other expert evaluations consider capabilities and economics, and once a computer is selected, the procurement should follow smoothly. Meanwhile, the computer center at Denver's state-run

community college remains empty and unused.

## System Sharing Idea Urged

A spokesman for the Colorado Commission of Higher Education (CCE) said that the commission was trying to establish a centralized system for about six colleges in the Denver area. It is possible that one central processor will be chosen, with remotes in the other five colleges; no one knows yet who will get the processor.

The students say that the commission's system sharing idea is fine for exchange and processing of administrative data, but they say that their data processing education will be "second-rate" if they can't get "hands-on" experience with a real, full-size computer.

A CCE spokesman told CW that the commission hoped to make recommendations by the end of the year, and that he was hopeful that delivery of a computer could be anticipated for March of 1970. He said that the commission would soon make a "decision in principle," that is, whether each of the schools should have its own computer, or that the system sharing idea should prevail.

The spokesman said that of 12 vendors who received "requests for proposals" from the state, about seven showed an interest in CCD's purchase intent. Requests for proposals have not been sent out for the system sharing principle.

## COMPUTERWORLD'S ADVERTISING REPRESENTATIVES

New York City:  
Donald E. Fagan  
COMPUTERWORLD  
Suite 3G  
120 East 34th Street  
New York, N.Y. 10016  
(212) 532-1790

Midwest:  
Bill Farrell  
COMPUTERWORLD  
Apt. 21B  
25 East Chestnut  
Chicago, Illinois 60611  
(312) 944-5885

San Francisco Area:  
Bill Healey  
Thompson/Healey Assoc.  
1111 Hearst Bldg.  
San Francisco, Calif. 94103  
(415) 362-8547

Japan:  
Mr. Naoyoshi Ando  
Fuji Corporation  
3-1, 5-Chome Yoyogi  
Shibuya-Ku  
Tokyo, Japan

Los Angeles Area:  
Bob Byrne  
Sherwood/Byrne/Clarkson  
and Associates  
1017 N. LaCienega Blvd.  
Los Angeles, Calif. 90069  
(213) 657-6221

National Sales Manager:  
Neal Wilder  
Sales Administrator:  
Dorothy Travis  
COMPUTERWORLD  
60 Austin Street  
Newton, Mass. 02160  
(617) 332-5606

New England:  
Robert Ziegel  
COMPUTERWORLD  
60 Austin Street  
Newton, Mass. 02160  
(617) 332-5606

## AN OPEN LETTER TO OUR CUSTOMERS

Dear Sirs:

This is the time of year when we at COMPUTERWORLD review the past and preview the future. This year's review is most gratifying. We have more subscribers, we've carried more editorial material, and in the last 6 months we've carried more advertising than any other computer industry publication.

The preview of our future is equally gratifying. We will expand our editorial coverage, we will print special industry supplements, and we will carry an even greater variety of advertising for computer industry goods and services.

None of the past, nor any of the future would be possible without you - our subscribers and advertisers - our customers. Thank you for this past, and thank you in advance for the future.

We are proud to share with you in an industry growing at the rate of one billion dollars a year.

May we at COMPUTERWORLD extend to you our best wishes for this Holiday Season, and continuous prosperity in 1970.

Sincerely,

*Neal Wilder*

Neal Wilder  
National Sales Manager

## TW Computerworld SALES Corner

H-125-32X, 6 Tapes  
1 Disk printer CD read/punch

If you need a 2nd or 3rd generation machine in 1970 - call us.

We'd appreciate it very much.

The best to you during the holiday season.

360/50 CPU - 1952

1401-C5, 1402, 1403, 4-729V's  
or 1211 Disk Drive

**TLW**  
COMPUTER  
INDUSTRIES

Box 2578 • Andover, Mass. 01810

• ACCOUNTING  
• INDUSTRIAL  
• EDUCATION  
• 404-451-1895

## Where can you cut your keypunch costs in half?

### In Hong Kong.

We'll keypunch for 50% of U.S. prices, 10-day turnaround, 99.8% accuracy guaranteed, 10,000 to multi-million card jobs. Sounds incredible? Call and let us prove it. After all . . . we invented computers.



china computer consulting company, inc.

New York, N. Y. (212) 986-2900

Palo Alto, Calif. (415) 328-7140

U.S. headquarters

47 MacArthur Rd., Wellesley, Mass. 02181

(617) 237-3422

## Computer's Role Not to Replace Middle Management, but to Keep It Informed

LOS ANGELES - The computer will never replace people at the middle management level in business, despite gloomy predictions to the contrary, says a University of Southern California business educator.

Rather, that electronic marvel is helping generate new and more efficient management styles and is enabling executives at all levels to function better, Dr. Milton G. Holmen, professor of management in USC's Graduate School of Business Administration, said in an interview.

"It has been proven that the number of middle management functions which can be computerized is 10% or less of such executives' work," Holmen said.

"The application of the computer has, in fact, made middle management people more free to really function as managers."

"With electronic data processing assuming some of their more mechanical burdens, they have more time to act as planners and facilitators, and to help their subordinates solve problems that arise."

Holmen said a key contribution of the computer to management is in giving information to all departments of a firm at all executive levels.

The information keeps all units advised on the status of projects in all other units as well as their own. This gives everyone the "big picture" - an overview that

makes possible the "participative management" and "management by objectives" concepts.

"For example," Holmen said, "it can be determined quickly that Department A is under budget and ahead of schedule, and Department B is over budget and behind schedule. This makes it possible for some of A's budgetary resources to be allocated to B, which is lagging behind."

"With the use of the computer, everyone in the organization knows more and can see where everyone else is in terms of the organization's overall objectives and projects," Holmen explained.

Holmen said he has found in his research at USC's Graduate School of Business Administration Management Laboratory that decentralization of management usually increases efficiency.

"And if management is to be decentralized effectively, adequate dissemination of information to all departments and levels of the organization is necessary."

"The computer is virtually indispensable in this role," he added.

## Royalties Given For Programs Used by Company

RED BANK, N.J. - Transnet Corp. has a new plan that can be profitable to computer programmers, and interesting as a concept for other users.

The company is offering royalties for programs submitted to and used by the company on its time-sharing computer system, according to John J. Wilk, president of Transnet.

The programs will be submitted by the author, and the royalties will be paid on the basis of the number of times the program is used in relation to the length of time it is used by means of a formula.

"We feel that this will give programmers an opportunity to get some of their programs in use," Wilk said.

"We are also considering the possibility of allowing programmers to use our system in developing new and unique types of programs in time-sharing," he continued.

Royalties are paid through Ascip, which also handles royalties for musical selections played over radio and television.

Programs using Focal, Basic, Fortran or Pal are acceptable for submission under the new royalty plan.

The company provides computer time-sharing and data processing services to business, industry, science, engineering, and education and uses a Digital PDP-8 time-sharing computer system.

## the computer industry's first key-to-disc data input system accepts the output from 60 or more key stations simultaneously

Time-shared input cuts data preparation costs 50%.

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you two money-saving advantages over conventional keypunch or one-keyboard/one-magnetic-tape-per-operator systems: (1) The LC-720 employs a computer time-shared input; (2) it is the only system available that provides data output directly on IBM 360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM 360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.



### LC-720 KeyDisc System

Bring your own data for a demonstration.

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a real magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tiechler, Director of Marketing (201) 334-3713

**LOGIC CORPORATION**

15 E. Euclid Ave., Haddonfield, N.J. 08033 (609) 428-4562

Subscribe to  
Computerworld

# Congress May Approve Data Banks on 33 Million

(Continued from Page 1)  
aggregates of statistics. These will all be personal profiles," emphasized Russell Pite, a Betts aide.

## Data Banks May Be Tied

In addition to being concerned about the centralization of data, Betts is also concerned that the new data banks will be tied together. Under the proposed Family Assistance Act, employable persons would be required to seek jobs, Pite said. "We anticipate that several million welfare files will be automatically referred to the job bank."

But Betts is not necessarily opposed to government agencies exchanging files. "In the interests of efficiency and economy we believe that agencies should be permitted to exchange records," Pite said. But he also said that some limitations should be placed on file exchange, and noted that government plans to automate data banks and make them compatible would greatly increase the opportunity for exchange.

## Call for Safeguards

"Built-in privacy protections should be legislatively provided at the outset," Betts declared. He proposed that three safeguards be included in the laws authorizing the two data banks:

- Individuals should be allowed to inspect the contents of their files, and if necessary challenge inaccurate information.
- "Once an individual terminates his participation in a public assistance program, his file should be destroyed and the person notified of this action."
- If a file is transferred to another agency, the person should be notified of this fact.

## Amend Proxmire Bill?

Betts supports the Proxmire Fair Credit Reporting Bill, but he stated that "before we go after commercial credit bureaus, we should put our own house in order." In addition to suggesting that privacy safeguards be added to the two new data banks, Betts said that he will urge the House Banking and Currency Committee to amend the Proxmire bill so that the same standards apply to the federal government as well as to private credit bureaus. "While I have long been concerned about the inability of consumers to protect themselves from false credit information, I am amazed that Congress has not questioned whether a similar situation might also exist in those federal agencies which utilize personal data reports in their normal course of work," Betts declared.

"The vast amount of decentralized individual data stored in Washington, as well as the countless requests for additional personal information, provides fertile grounds for invasions of individual privacy," he warned.

## Privacy Just a Detail?

CW previously raised the issue of privacy and the job bank in an editorial Aug. 27, 1969. Joseph Loftus, Special Assistant for Communications of the U.S. Department of Labor, responded with a letter in which he said: "We are very conscious of the

importance and the sensitivity of the privacy issue." He explained that the Manpower administration has established a task force to examine "every conceivable aspect of this difficult area."

But Loftus opposed the inclusion in the Manpower Act itself of any privacy controls, explaining, "It was our judgment that this would have added peripheral administrative detail to the customarily substantive provisions

of legislation."

The Social Security administration apparently does not have any file system comparable to the one it would have to set up under the Family Assistance Act. According to Lawrence Lewis, a Social Security information specialist, the Social Security administration maintains files on about 20 million beneficiaries, plus inactive files on people who have applied and

been rejected.

In addition, they have earnings records on about 180 million people, he said.

The beneficiary files contain applications and supporting evidence, and are available to no other agencies (Justice and Treasury agencies have access in national security cases).

But state welfare agencies can request information such as date of birth, period of disability, and

amount of Social Security payments. In addition, the amount of earnings can be given out if the individual approves.

Complete Social Security files are not kept in machine-readable form, Lewis said. But computers are used to maintain benefit roles, enforce the earnings test (by comparing earnings reported by employers with the maximum allowed), and make payments.



The Lenkurt 25B may be the only data modem that really deserves to be called a little black box. For a modest-sized piece of equipment, it does an amazing job.

It handles computer, telegraph, and telemeter data... individually or in combinations.

You can transmit up to 25 channels over a single voice circuit. Plug-in filters give you a choice of five data speeds from 75 b/s to 600 b/s.

And you get 20% more speed for a given channel.

You can use it for single-channel or multi-channel operation. Or as terminal equipment to work into other modems.

**LENKURT ELECTRIC**  
Divisions of GENERAL TELEPHONE & ELECTRONICS

People who know our other video, voice, and data equipment won't be surprised to learn that the 25B is fully compatible with Western Electric's 43A/43B. (We've always been very easy to get along with.)

The 25B is a great little black box, designed by a company that really knows data transmission. (And microwave, multiplex, cable carrier, and coaxial cable systems, too.)

Even though to us, it will always be a computer-telegraph-telemeter data modem. Lenkurt Electric Co., Inc., San Carlos, California.

## Data Transmission Systems from Lenkurt

## Editorials

### Protection Backlash

Patent infringement suits, intended to enable a software designer to salvage his rights, have backlashed at the user. Control Data Corp. now says, in effect, that if a user is sued for using CDC-supplied software, the user must defend himself at his own expense and pay the plaintiff if he, the user, loses.

Since the cost of such a suit, whether the user wins or loses, is an unknown quantity, this CDC policy is going to cause many users, especially the smaller ones, to think hard before using CDC software.

Suddenly the battle for better software protection, instead of encouraging the development of better software, threatens to reduce the use of outside software.

The only immediate answer available is for CDC to return to the policy of guaranteeing to protect the user against such suits.

### A 'Patent' Solution

Patent-search problems can be solved, right now, by computer technology. The only problem is a misdirection in the attempt to patent programs.

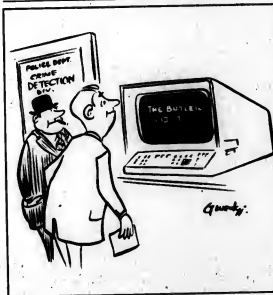
The problems facing those who wish to obtain a patent on a computer program, and facing the patent office in determining the validity of the patent claim, are not a result of the law, but the result of the data explosion facing all aspects of industry and law.

This is a problem that computer people, particularly, should be well equipped to solve.

Many people advocate changing the law to eliminate the complexity of the problem. This running away will not only not solve the problem, but it will not provide a proper means of protecting any type of patentable device.

Data management, especially through the use of computers, is a clearly solvable problem. It does not suffer from any real degree of complexity, merely one of size.

Size, alone, does not make a problem more complex, simply more difficult and expensive to solve properly. The computer industry possesses the necessary tools to solve the problem. Why aren't they applied, instead of all this shouting and fuming over legalisms?



### Not His Kind of Fire



## Letters to the Editor

### Computer Professionals:

#### Why the Need?

Concerning your editorial: 'Why the Computer Professional?'

As a holder of the Certificate in Data Processing, I feel that your dismissal of the DPMA program was unfair.

The Certificate is not awarded by examination alone. Candidates must have certain experience and academic qualifications. Also, they must have statements of their character made by their superiors prior to being allowed to sit for the examination.

A comparison of the CPA-CDP programs is illogical. The changes in data processing in the last decade were far more complex than the changes in public accounting. A comparison is only possible on the prerequisites for each Certificate.

Your editorial seems to be an attempt to establish yet another "professional elite." This means to see how many initials you can amass to the right of your name is absurd. Despite your editorial, the only reason I can see for a "computer professional" is to increase the job hunter's base pay. A true professional will do professional work regardless of his initials.

James F. Farkas, CDP  
Director - Data Processing

Latrobe Area Hospital  
Latrobe, Pa.

There is no question that the DPMA Certificate in Data Processing is better than nothing. The question is whether there should be required licensing of DP people as there is for doctors, lawyers, architects, and other professionals. Such licensing carries legal penalties for practicing without a license and for failing to live up to set standards. Ed.

### BIT 483 Presented

#### As Business Minicomputer

In the Dec. 3 issue CW's Software Editor discussed the lack of minicomputers designed with the businessman in mind. I would like to bring to Mr. Briggs' attention the BIT 483, a variable word length minicomputer.

The BIT 483 has been designed for easy data manipulation, has a standard overlapped data channel, and has the ability to perform decimal arithmetic as well as binary arithmetic. All this adds up to a very powerful minicomputer for business applications, especially with some low cost peripherals and some business oriented software packages.

But, the BIT 483 is not just a business computer. Its variable word length is also a big help in other applications, such as numerical control and data communications.

I am surprised that Mr. Briggs was not aware of the variable word length BIT 483, since BIT, Inc. has advertised the 483 in CW quite recently. It seems to me that CW's editors should be familiar with the products advertised in their paper.

Mary B. Parent  
Staff Assistant

BIT, Inc.  
Natick, Mass.

Though the BIT 483 does possess variable-word arithmetic capabilities, this was not the point of the article. The instruction set for the 483 is as far from a business orientation as is the instruction set of the Nova system. No provision is made for moving variable-length character strings, nor for character-oriented compare operations. These are the type of hardware features that support data processing, as opposed to computing. Variable-length bit-oriented arithmetic is not relevant. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

SUBSCRIBE TO  
COMPUTERWORLD



## Viewpoint: Computer-Controlled Credit Cards

## Reistad Views a Future Cashless, Checkless Society

By Dale L. Reistad

I would also like to bring to your attention certain aspects of the credit card business that merit consideration in the months ahead. In doing so, I would like the present status of the bank credit card field to that of a ship at sea, now sailing on a stretch of beautiful water after having experienced high seas and stormy skies, but, nevertheless, heading directly into a fog bank without a single chart, compass, radar device, or radio to assist in the unknown sea ahead. It may be that the fog bank is about to lift, and that the beautiful water will then stretch out beyond, even to infinity. Or, it may be that the fog will get increasingly dense, the navigation more difficult, and the hazards frequent and dangerous.

Some of the more important of these aspects, with implications for what lies beyond the "fog bank," are as follows:

## The Card Itself

To begin with, there is nothing sacred about the card itself, either in its size, its content, or its purpose. To be perfectly frank, it does nothing more to help than serve to emboss a triplicate deposit ticket. I thought the punched card was sacred; that is, until IBM announced its new computer and new mini-card. Look for radical changes in card design as a result of the new era of superconductive transports, or SSTs. Don't be surprised if future credit cards have no raised letters or font. Credit cards in the future will be electronic cards, not embossed cards.

## The Terminal

The electronic cards will activate electronic devices in future systems. Even today you can buy the terminals which will be

activated by credit cards in the future. At least a dozen companies produce funds transfer terminals. None (to my knowledge) are being designed to handle today's embossed card. While no single concept yet prevails, there is an obvious trend toward terminal systems which anticipate that some form of electronic storage capacity will exist in the card.

## Fund Transfer Computers

The terminals will, in turn, feed into fund transfer computers. The fund transfer computer could be conceptually designed by the average child. The need is for a computer to allow a customer in bank A, to transfer money to a merchant that has an account in bank B. It's as simple as that. Today this transfer is accomplished through a bank clearing house. Tomorrow the clearing house will be electronic. In a community of 10,000 there will be over a million transactions flowing through such a fund transfer system, or approximately 100 transactions per person, per year. This includes all types of transactions: credit card, store account, cash, and check.

## The Optimizers

Questions are frequently asked about the electronic fund transfer system account structure. The fund transfer center will have a customer record with account number, bank code, verification code, and amount code for each consumer in the service area. The answer to the question "Is it a charge or cash transfer, transaction, or can both be accommodated by the system?" will vary from bank to bank. Ultimately, however, the customer will just use the system, and the computer at the customer's bank will make the decisions as to whether transactions

Dale L. Reistad, former director of the automation department of the American Bankers Association and now president of Payment Systems Inc., New York, has spent a good deal of his time forecasting the cashless, checkless society.

In this article, excerpted from a speech he made to the Midwest conference of the Charge Account Bankers Association, he looks at forthcoming changes in the credit card field.

should be charge or cash transfer. After all, the computer will have access to more information about the transaction than the customer.

Having thus described the probable series of steps beyond the credit card, now what about some curfew on the present era of credit cards? Why not agree to a date beyond which you will switch from first generation to second generation credit cards and related systems? Why not begin to plan now for what is certain to lie beyond today's credit card? It can assure you that certain lead banks and others are already well engaged in such planning. What I'm afraid of is that many banks believe that the credit card is going to be around for a long time in its present form. They think the fog bank will clear and it will be smooth

sailing from then on. Let me throw out a few thoughts on why the fog bank will get a lot thicker before it lifts.

■ The era of the SST, which will bring with it the SST standard for air travel and T & E cards. Can banks afford not to adopt the standard?

■ The march toward combined statements and line-of-credit services tied to checking accounts. Where does the credit card fit into the picture?

■ The natural aspiration of the less affluent to own a credit card, just as it says on TV, if credit cards continue to become of greater significance to the consumer credit systems, can roughly one-third of the consumer public be disqualified from participating for long?

■ The large number of customers of financial institutions which are not a part of the fund transfer mechanism. Will they convert to commercial bank customers out of sheer need?

■ The relationship between banking and retailing. Is the credit card battle nearly won by banks or is it too early to tell?

■ The broader implications of welfare payments—expected to surge from 11 to 25 million people within the next five-year period. Will banking provide the transfer mechanism and will the credit card, or an identification card, be involved?

■ The primary question. Will a

single number system develop and with what consequences for society?

Of necessity, this is an incomplete list. I haven't touched on such things as authorization, national interchanges, fraud protection, verification technology, nor a raft of other factors to be considered. My suggestion is that you consider the credit card system, which now exists, to be temporary, and that you set a curfew date, say in late 1970, beyond which you want some of these hodgepogs off the street. If new directions are to be taken, why should you be the last to find out? If some pioneering is required, perhaps some of it should be done here in the Midwest. If the present system is the ultimate, then I would suggest another good hard look at the balance sheet.

## Subscribe to



Computerworld

# MARKETING

PROFESSIONAL MARKETING SERVICES FOR THE COMPUTER INDUSTRY

VENDERE INTERNATIONAL MARKETING CORP.

400 N. THIRD AVE. SUITE 1000 NEW YORK, N.Y. 10014

## for your inside news.

EDP Industry Report, "the grey sheet", is generally regarded as the most authoritative source of market facts and figures on the \$12 billion-a-year computer industry. Its twice-a-month issues provide subscribers with facts, ideas, and insights on the computer market. Its well-researched contents have enabled it to become one of the most-quoted publications in the EDP field.

EDP/IR is published 24 times a year by the International Data Corporation, the largest market data gathering, analysis, and publishing company in the computer and information processing industry. Subscriptions \$75 per year. Free copy of annual Review and Forecast issue sent with pre-paid subscriptions. Write:

### EDP Industry Report

Department D-19  
60 Austin Street  
Newtonville, Mass. 02160

## European Communication Interests

Our Vice President of European Operations will be in the U.S. from December 29 to January 9.

He will be available for consultation or to discuss prospective consulting assignments. Interested parties are invited to call or write for an appointment and/or a brochure on our European Division.

Product & market planning services for equipment manufacturers.

Planning, design & feasibility studies for users.

### BERGLUND ASSOCIATES, INC.

Consultants in Applied Telecommunications  
1060 Kings Highway North  
Cherry Hill, N.J. 08034  
609-667-4700

## Front End Minicomputer Without Core Costs \$1,800 in Smallest Configuration

FAIRFIELD, N.J. - A mini-computer, billed as either a front-end processor or as a general-purpose computer has been announced by Unicom, Inc.

The basic CP-3A consists of a 1.5 gmc cycle processor, 512 bytes of read-only memory, 4 scratchpad registers, and a set of 40 byte-oriented instructions. This configuration costs \$1,800. For use as a general-purpose machine, the price goes up, as

memory is added.

The company says that "a powerful set of I/O instructions is capable of addressing up to 1,024 external devices." There are also CP-3B and -3C models, with 47 instructions, up to 16 scratchpad registers, 1-4K bytes of ROM, 1-32K bytes of core, and priority interrupts. One level higher is the 'D' model, which adds magnetic tape cassettes. This model, with



Unicom CP-3A

1,000,000 bytes of tape storage and 1K of core is priced "under \$5,000."

Delivery of the A model is scheduled to start next February, with the other models scheduled for March delivery.

Unicom Inc. is located at 1275 Bloomfield Ave. here.

### KEYPUNCHING KEYPOWER

- 1/4 Million Card Capacity Per Week
- Volume Discounts
- Assured OCR Reliability
- Rapid Turnaround U.S.A.

#### CALL 128 KEY PUNCH

New York: 866 U.N. Plaza (212) 752-7186  
Boston: 146 Bowdoin St. 742-8165  
Waltham: 15 State St. 899-4850

### PROGRAMMERS SALESMEN SYSTEMS ANALYSTS

#### KEEP YOUR PRESENT JOB

But register with us, we will keep you informed of new and interesting situations as they become available. All you have to do is send us your resume marked "Register" or call and let us have the information.

No Fee Are Charged For Applicants

#### COMPU-FORCE

PERSONNEL AGENCY, INC.

15 E. 40th St., New York, N.Y. 10016  
212-679-3126

Specialists in Computer Personnel



The Answer To  
I.B.M.'s  
Historic Unbundling!  
A System Generation  
and Maintenance

**SERVICE**  
performed by our expert  
system engineers.....  
who will visit your  
installation each month  
to insure proper functioning  
of your operating systems

**BEST OF ALL....**  
It will save you some of  
the dollars (\$) that the  
UNBUNDLING will be  
forcing you to spend!



INFORMATION  
STANDARDS,  
INC.

295 MADISON AVENUE NEW YORK, N.Y. 10017  
(212) 869-2540



COMPUTERWORLD

## systems/peripherals

### Photocomp CRT Has Serif Input/Output

BETHEL, Conn. - A graphics display system which can make use of the full 128-character ASCII set to produce upper/lower case serif type fonts has been developed by Computer Optics Inc.

Designated the CO-70, the system can display up to 3,000

characters on its screen, and can also act as input in a photocomposition system. It has full edit-



Computer Optics CO-70

ing capability, according to the manufacturer.

The unit has so far been interfaced to the IBM 360 and 1130, and the DPC PDF-8. The company plans to add RCA Spectra 7045 and 46, and the CDC 3300 to the list.

Options include magnetic or paper tape I/O, push button data generation, operator or computer-controlled hard copy, line drawing graphics, and color CRT output.

Prices of the unit vary from \$131 per month to \$262, depending on options. The company says that initial deliveries will start in early 1970, with full production shipments in June or July.

Computer Optics Inc. is located at Berkshire Industrial Park here.

### Device Converts Card PUNCHES to Card Verifiers

FORT LAUDERDALE, Fla. - A punched card verifier-adaptor converts any IBM 024, 026, or 029 card punch to a card verifier, making punching and verifying operations immediately interchangeable on the same machine with a turn of an operator-controlled switch, according to Data Research Corp., the manufacturer.

The single unit punch-verifier allows operators to either punch or verify for immediate correction of errors. The unit eliminates the transferring of cards from one machine to another, the company states.

Installation of the DRC verifier-adaptor is available at the user's facilities. The unit leases for \$28/month through Western Union Computer Utilities Corp. Installation, according to the firm, does not void or alter IBM service or lease contracts.

Data Research Corp. is located at 2601 East Oakland Park Boulevard.

### Audio Response for 1130 Called Less Expensive

CHICAGO - A low-cost computer attachment, programmed to respond to questions with a human voice, is said to offer IBM 1130 users immediate access to their computers from Touch-Tone telephones in the United States. Technical Computer Services Corp. is offering the unit.

Called the Datalot CL-114, the unit attaches directly to an IBM 1130 computer. It has a basic vocabulary of 31 words, which can be increased to 62 or 124 words upon demand.

A client calls in, establishes his identity and enters his data using the Touch-Tone buttons. The computer responds with a human voice, sending information,

requesting further data or confirming data received. It is key to give only authorized users access to restricted information.

The manufacturer states that this unit was designed specifically to attach to minicomputers, providing a service once available only to very big computer users. It used to cost approximately \$1200 a month. TCS clients can add Voice Response to their computer capabilities for under \$300 a month. This is for the 31-word system, which sells for under \$10,000. Delivery is 30-60 days.

Technical Computer Services Corp. is located at Eden East, 6200 North Hawatha Avenue.

### Off-line Graphics System Held Faster and Cheaper

ANAHEIM, Calif. - The CalComp graphics output system 900/1670 is a high-speed, high resolution offline Com (Computer Output Microfilm) system that draws at the rate of 500,000 increments/sec. and prints at a rate of 5,000 line/min, depending upon the size and variation of software generated type fonts. Any type font or variation can be used - in any language, according to the company.

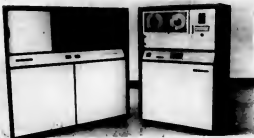
Options include a form projector with 16 program selectable forms and a high-speed character generator which is said to increase the average printing rate by 100%. Cameras are available for 16mm or 35mm sprocketed or unsprocketed microfilm. A

105mm microfiche camera also is offered as optional equipment.

The system is composed of a Model 900 controller, a stored program device, a Model 937 magnetic tape unit, providing up to 30,000 byte/sec input to the controller, and a Model 1670 microfilm printer/plotter, featuring a programmable raster of 16,384 by 16,384 positions, the highest plot resolution available.

The base price of \$130,932 is about one-third less than comparable systems, according to CalComp. Initial deliveries are scheduled for the second quarter of 1970.

California Computer Products Inc. is located at 305 N. Muller St. here.



Computer Output Microfilm

## 1969 EDP Developments in Retrospect

# Unbundling Antitrust Suits Headed 1969 News

### CW's Top 10 1969 News Stories

Here are the top 10 news stories of 1969, as selected by *Computerworld's* editors, and as chosen on the basis of their importance to the computer user.

The top story of the century, of course, was the moon mission, which would have been impossible without the aid of computers. However, the Apollo missions are not included in the list of the top news stories for the computer user, since the impact of the missions is on mankind in general, and has little if any effect on the end user himself.

1. Separate pricing; user and industry reaction
2. Antitrust suits against IBM
3. Software patents
4. Independent network to compete with Bell System
5. New industry model: Viatron System/3
7. Input technology advances
8. Joint Conferences outstrip projections
9. Attacks on computer centers
10. Misuse of computers

By Edward J. Bride  
and  
Peter F. Carr  
CW Staff Writers

The pulse of progress is beating strongly as a turbulent decade comes to a close.

The technological community's rampant progress rivaled sociological developments in the years of second and third generation computers, the threshold of a new era for programmers, competition for corporate giants like IBM and the Bell System, and concern over the direction which change has taken.

The year just ended saw new concepts, new products, and new concern over old problems. As might be expected of an industry giant so far ahead of competition, IBM headed the list of the year's most dynamic and significant industry-oriented news stories.

IBM kept its 1968 promise and

announced a significant change in pricing policy, separating hardware from software and services.

This long-awaited "unbundling" had been expected to cause a significant reduction in both purchased and leased hardware costs, but only a 3% drop resulted. Some people estimated that the end result of separate pricing would be a 15% to 25% increase in costs.

IBM's unbundling, plus indications from the U.S. Patent Office that some sort of protection will be afforded computer programs should be a boon to the software industry.

#### Breach of Contract Charged

User reaction to unbundling varied, and one user went so far as to file a \$5 billion breach-of-contract suit against IBM. Motor Replacement Co., of Phoenix, filed its class action, charging that IBM was forcing it and other users of IBM equipment to pay for services which had been offered "for the life of the machine."

Greyhound Computer Corp. also filed suit, charging unfair competition and breach of contract. Greyhound purchases IBM equipment and then leases it out at a fixed rate below IBM rental rates.

IBM, of course, denied that either suit had merit. Industry reaction was also varied. Some large manufacturers followed with their own unbundling agreements, while others decided to raise prices and stay "bundled." Still others adopted a "wait and see" attitude before committing themselves to a permanent policy.

Control Data unbundled,

Honeywell did not, but announced a slight rental increase. NCR will provide free service on the amount of monthly rental. Burroughs will make selected software proprietary. General Electric raised prices and stayed bundled. Univac and RCA announced "no changes."

#### Five Fie Antitrust Suits

Lawyers at IBM were very busy people last year. Aside from the two breach-of-contract suits, the large corporation was called monopolistic by the Justice Department and four companies.

The Justice Department said that IBM had hindered the development of software industries by its "bundled" policy.

The four companies who attempted to collect damages as a result of this single pricing were Applied Data Research, Control Data, Programmatic, and Data Processing Financial and General.

The latter antitrust suits all cited one or both of the 1935 or 1956 consent decrees signed by IBM. The decrees prohibit tie-in sales like single hardware-software-service contracts, according to ADR.

The four suits were consolidated in U.S. District Court in St. Paul, where Federal Judge Philip Neville ordered all references to the consent decrees stricken. IBM said that the apparent effect of striking the references would be the removal of \$4 billion from the total of \$10 billion being sought.

Judge Neville denied a motion by IBM to have certain other charges stricken from ADR's complaint.

The next court hearing is set for January 12.

## Issues of 'Concern,' Fear of Misuse Seen in Attacks on Computer Centers

Two of the year's top 10 stories can be combined under the classification "issues."

Attacks on computer centers were seen as protests against certain applications, mostly military.

In some cases, the incapacitating of a computer center was used to cripple the orderly process by which a college or business was operating.

Closely aligned with the attacks on computer centers is the misuse of computers.

Concern over misuse is directed more to errors, wrongful use of data, or unauthorized access to data, rather than to a particular undesirable application.

Unrest and dissatisfaction of the college generation was reflected in several incidents of attacks on or capture of computer centers.

The erasing of a thousand tapes at a Dow Chemical computer center was evidence of concern over militarization of computers.

What really loomed, however, was the issue itself, not the individual attacks or occupations. Society has become concerned at the direction it took in the 60s, and wishes to approach the 70s in an orderly way, perhaps not so rapid pace.

The user is becoming concerned, too. Not only because he is an integral part of society, but also because his livelihood is extremely vulnerable to the whims of dissidents.

Many times the occupation of a computer center was used as a tool for militants to bring promises of policy changes from college administration officials.

#### Adult Dissidents Also Speak

Nor were college "kids" the only dissidents. The Joint Computer Conferences were arenas for the airing of problems, but solutions were conspicuous by

their absence.

'Some people merely suggested that the rapid rate of technological advancement should be slowed so that society can catch up. Others merely projected continued gloom for the computer community.

The fact remains that advances were made within the industry, and computers themselves helped hospitals, communities, and businesses. The percentage of militant dissidents is probably no higher in the computer society than it is in any other industry.

But make no mistake about it. The unrest is present, and militancy can do much harm to the computer user.

#### Computer Errors, Misuse

Another "issue" which drew much concern in 1969 was output errors and the misuse of computers.

There were several instances of both of these drawbacks, although no single occurrence would rate the problem as one of the year's top stories.

Erroneous computerized dining is probably one of the most common problems that reaches the non-users, as well as those within the industry.

It became apparent last year that, in some cases, a notice of nonpayment could get to a recipient without ever being touched by human hands, except for putting the envelope in a sealing machine.

Computers were given "names" by some collection agencies. Dunning notices would be "signed," but the signature only denoted what type of account was being billed.

Computers also helped solve this type of problem, however, as seen in the case of the theft of several hundred blank "Diners

Club cards. A computer analyzed the spending habits of regular card holders, and the theft was eventually solved.

Concern continues to rise in the issue of the National Data Bank. Some observers see the data bank as inevitable, and are just as convinced that it will be misused.

Security is a great problem; this fact is admitted by all proponents of the data bank, although proposed solutions are few.

## OCR Unit Advanced Input Technology

A development representing progress in the field of input technology was made in September with the announcement of an optical character reader capable of learning new characters or entire alphabets on-line.

## Need for Program Protection Cited; Users Look to Courts for Direction

WASHINGTON, D.C. - Software protection became a much-discussed topic last year, but solution of this problem is not at hand.

Most users replying to a Patent Office request for opinion favored strong forms of protection for computer programs. However, ideas ranged from patents to copyrights to internal controls.

Trade secrets were mentioned as an alternative to protection, a development which would hamper emerging software users and the computer industry itself, according to many respondents.

The Court of Customs and Patent Appeals upheld a decision

The machine is presently being used in the service division of Compuser Inc. A second system, also to be used in the company's service division, is expected to be in operation by the end of January.

The machine is presently being used in the service division of Compuser Inc. A second system, also to be used in the company's service division, is expected to be in operation by the end of January.

The decision, along with IBM's unbundling, is expected to be a boon to the software industry. Both events should have some benefit for the user, since he will now know what he is paying for, and be able to demand quality.

Price increases, however, are inevitable. Despite the Prater & Wei decision, being, as one observer put it, "Magna Carta for the software companies," the ACM predicted that IBM would dominate 90% of the software industry.

The machine's ability to accept any type of input or style of text, its ability to read several fonts at the same time, its ability to accept any special symbols, its ability to read unfurnished material without any special programming, and its ability to scan graphical documents is a breakthrough in solving the problem of getting large amounts of past data into data banks. In some cases typewritten material going back to 1915 has been read and entered.

Although the price, \$900,000, is prohibitive in many cases, the company is planning on making specialized versions of the optical character reader by cutting out some part of the present machine.

This would probably reduce the price of the machine, according to a company spokesman. No date, however, has been set for production of the smaller models.

TXW NEWS TO  
COMPUTERWORLD  
FAST  
TXW 170-335-6435

## 1969 EDP Developments in Retrospect

# Viatron, IBM Establish New Industry Concepts

The small user will no doubt benefit from the introduction during the year of a number of innovations designed to reduce the price of hardware and put a wider choice of equipment on the small computer market.

### Viatron System 21

Deliveries of Viatron's System 21 began in October in the Boston and New York areas. Designed to crack open the market for EDP equipment with low-priced, mass-produced hardware, the System 21 terminals rent for about \$440/month. The company, however, was reluctant to release the number of installations it dated to make by the end of the year.

To complement the terminals, the company announced the development of two general purpose computers scheduled to be delivered in mid-1970.

The addition of this equipment will enable small users to interconnect multiple System 21 terminals (up to 24) with a central processor at a remote site for batch processing, according to the company.

The smaller of the new models, the 2140, is a 4K, 16-bit word memory, with 8 I/O channels to support the System 21 terminals, and will rent for \$99/month.

The 2150 will rent for

\$199/month and has an 8K, 16-bit word memory, hardware multiply/divide, and 24 I/O channels.

Viatron plans to create a network of service depots to provide 24-hour emergency service for on-site repair or replacement of units, with normal maintenance based on replacement rather than repair.

This service will be a part of a network of dealers who will rent, sell, service, and provide systems support for Viatron products.

### IBM System/3

The announcement in July of the IBM System/3 marked a breakthrough in the development of a computer designed for the small business user.

The System/3 contains a number of major innovations including:

- A small 96-column punched card, 16 columns greater than the familiar 80-column card;
- Disk storage ranging from 245 to 840-million characters;
- RPG II — an expanded version of a popular programming language; and
- Monolithic Systems Technology (MST).

Despite delays in delivery [CW, Dec. 10], users of unit-credit equipment are optimistic about

the System/3 as a solution to the dilemma of taking advantage of the latest technology while keeping costs down.

CW has spoken with many of these small users and found that many feel they can make the transition from their present equipment and become

computer installations by installing the System/3.

Reactions from competitors range from a position that the System/3 will have no effect on the market, to one of happiness that a new market has been opened up.

NCR maintained that no im-

pact had been made on their Century line or any of their other products. On the other hand, GE, whose Model 55 competes directly with the System/3, felt that the publicity generated by the System/3 is bound to have a beneficial result for all of the manufacturers of small systems.

## Families: a Year for Expansion

By Frank Plasta

CW Staff Writer

With the exception of the IBM System/3, the most significant announcements of computing systems by major manufacturers were in the area of extensions to existing equipment.

The IBM 360/195 is now the largest model of the 360 line, dropping the Model 95 to second place. Univac added significant capability to the low end of its 9000 Series with the introduction of the 9200 II and 9300 II models. The 1106 from the same manufacturer expands the 1108 into a family of systems.

RCA, with the Spectra 70/60 and the time-sharing 70/61, is entering the giant computer market for the first time.

The GE Model 120 marks a new top to the familiar 100 family of computers. The Model 655, also by GE, and the newest member of the 400 Series, is the fastest GE processor yet.

### IBM

Of the eight major announcements of general purpose computers those of IBM generated the greatest interest.

The IBM System/3 will probably have a greater impact on the data processing user than any other system already announced. Since July, an estimated 3,000 customers have lined up for delivery of this first system from IBM that may be able to replace the small tab user's equipment.

Just ten years ago, IBM brought out another system, the 1401, that was not considered a true computer by some office observers. Computer or not, over 9,000 users made it the most popular data processing system to that date. The System/3 customers are just as eager to buy, and even more numerous.

The impact of the System/3 will extend beyond the limits of its own installations. Unless first indications are completely misleading, the effect of the 360-column card will be felt throughout the industry. Competitors will certainly be unable to ignore a market that promises to be of large size.

Accessory suppliers have already introduced card-handling devices to make use of the new System/3 card format — the first major change in tabulating card design.

If the System/3 promises to be the most popular of the newly announced systems, the IBM 195 is the most interesting. Among its users, the 195 constitutes a serious threat to the

CDC 7600 and to CDC's plans for holding the large-scale scientific market.

IBM states that most programs for other large 360s can be run on the 195 without modifications. The exceptions include time-dependent programs, user-modified channel command words, and some user programs.

Almost all peripheral equipment currently available with IBM's largest computers will be compatible with the 195. The largest system departs from the 90 Series in that it is available on a lease basis. The older models are available on a purchase-only plan. Lease prices for the 195 will range from \$165,000 to \$300,000 per month.

### Univac

During 1969 Univac extended two existing lines with three products: the 9200 II, the 9300 II, and the 1106.

The 9200 II is basically the same processor as the card-oriented 9200, the first member of the 9000 Series. The 9200 II differs from the 9200 in that it has available some of the peripheral equipment up to now restricted to the 9400 in the 9000 family, including disk drives, tape units, and high-speed printers.

A typical magnetic tape 9200 II will 24K of plated-wire memory, 600 card/min card reader, 200 card/min card punch, 100 line/min line printer, in addition to the integrated 250 line/min printer and three tape units, will rent for \$4,565 per month, including maintenance, and will sell for \$15,935.

Announced along with the 9200 II was the 9300 II. The multiplexer channel, optional on the 9300, is standard as is a 333K byte/sec selector channel. Both the high-speed printers and 8411 disk system are available on the 9300 II.

Rental charges for a typical magnetic tape 9300 II will be \$5,775 per month including maintenance. The system will sell for \$208,200.

The 1106 was Univac's third announcement of the year. Similar in most respects to the 1108, it differs mainly in that it has no multiprocessing capabilities. Priced near the IBM 360/50, the 1106 is claimed by Univac to have performance at the 360/65 level.

A typical 1106 configuration will rent for \$37,000 per month, \$15,000 less than a similar 1108.

Univac, 1108 users that do not have an 1108 and a half will find the 1106 a solution to their

problems, according to Univac.

### RCA

RCA added two systems to its Spectra 70 line, the 70/60 and the 70/61. The Model 70/60, a larger and faster version of the 70/45, is said by RCA to be twice as fast as the 360/50, with which it is competitive in price. The 70/60 is available in memory sizes ranging from 131K to 1,049K bytes, becoming the first RCA computer in the mega-byte class. Main memory is core, with a cycle time of 1  $\mu$ sec. The 100 nanosec scratch-pad memory has a capacity of 1,283 32-bit words.

The Spectra 70/61, basically a time-sharing version of the 70/60, bears much the same resemblance to the 70/60 as the 70/60 does to the 70/45. It is equipped with a magnetic drum that extends virtual memory capacity of the system to 2 million bytes, together with a read-only memory for use in paging.

### GE

The two GE announcements were also extensions of existing lines — the 120 and the 655.

The 120, the newest addition to the 100 Series, features 360-compatible RPG. Priced at \$2,980, a typical magnetic tape configuration would include 12K of 4  $\mu$ sec core memory, a core-15K byte/sec tape units, a 400 card/min card reader and 300 line/min printer. The disk system and two DSU-160 disk drives and the same central processor reader and printer will rent for \$3,310.

The 655, priced to compete with the top end of IBM's line, is the fastest GE system to date. Compared to the 635, the 655 is twice as fast, with a cycle time of 0.5  $\mu$ sec, and is available in a wide range of memory sizes, 32K to 256K words. Other hardware is almost identical to that of the older model. All software developed for the 635 will be used with the 655. A minimum configuration of the 655 will carry a rental charge of \$80,000 per month.

### DOS SYS/GEN

DOS held out your staff's creative talent. Come up to the future without tying your valuable talent to training and operations staff. Our highly skilled and experienced personnel are available for DOS/GEN on your computer.

### CONTACT

COMPUTER BUSINESS APPLICATIONS, INC.  
Suite 1434 14th Ave. N.E.  
Philadelphia, Pa. 19101  
PHONE 215-683-7676

## Technological Advancement Reflected in Conferences

MONTVALE, N.J. — The Joint Computer Conferences continued to grow at a rampant rate in 1969, reflecting the increases in computer technology and consumer interest.

Although final estimates are still not available for the Fall conference in Las Vegas, it is anticipated that the combined total for both conferences will pass 65,000. Spring attendance was 37,000.

New records were set in just about every category, according to the American Federation of Information Processing Societies (AFIPS), conference sponsors. Visions, new and total exhibitors, exhibit space, and new products all set records at either the Boston or Las Vegas meetings.

## MCI Has Data Competition for Bell

A national microwave communications network designed to compete directly with the Bell Telephone Network in transmitting computer data was announced in September by Microwave Communications Inc. (MCI).

In making the announcement, John D. Goeken, president of MCI, said that permission had been obtained from the FCC to set up the first link in the system, from St. Louis to Chicago, and construction had already begun. This link should be in service by mid-1970, he

said. Transportation, lodging, and communications problems continue to plague the conferences, and no solution is imminent in this area.

AFIPS is anticipating that industry growth will be reflected in future shows, and rough predictions for the 1970 SFCC in Atlantic City range from 40,000 to 80,000. About half-way in between is probably close enough for speculation.

AFIPS has made available the proceedings of all 35 conferences, reproduced on either microfilm or microfiche, depending on the year. Sets are available in various compilations through AFIPS Press headquarters here.

Fifteen other links will serve to connect the rest of the country, Goeken said. Permission has been requested from the FCC for five of these, while the others are well along in the planning stages, he stated.

The microwave system will provide an alternative to the present Bell Telephone Network for transmitting computer data and radio and television transmission. Assuming FCC approval, the system should be fully operable within three to four years, Goeken said.

## 1969 EDP Developments in Retrospect

# Minis and Peripherals Dominate Small Hardware News

By A. B. Williams  
CW Staff Writer

During 1969, various segments of the small processor and peripheral market dominated the news. Among these were the minicomputers, mass memory storage devices, keyed entry-data units, and computer output microfilm devices.

A year ago, minicomputers were defined in terms of processor (usually a 16-bit word job using a binary scheme of arithmetic and addressing), and price (the first under-\$10,000 mini was introduced in late 1968).

Minis, generally, are supplied by the manufacturers with no peripherals and minimal software — often just a Fortran compiler and an assembler. A few manufacturers offer more software or peripherals, but charge more money for the product.

The market has grown from the original four or five manufacturers (still dominated by Digital Equipment Corp.) to include a much larger number. Prices have been forced down. During 1969, two of the original suppliers lowered prices.

### Mass Memory

For mass disk memory products IBM compatibility is the obvious goal. During 1969, the trend spread from the major mainframe manufacturers making physically compatible drives through established peripheral companies, into new firms established to take advantage of IBM's price and performance umbrellas.

To illustrate the proliferation, it is now possible to interface an IBM-compatible disk drive to a non-IBM computer with a non-IBM control unit, and have all three manufacturers by different companies.

While the IBM 2311 disk drive was the original target for competitive equipment (DOS being as popular as it is), the 2314 mass disk memory has had its share of action. One company has zeroed in on the very slow-access 2310 disk drive used on IBM's big-selling 1130 computer. Originally, competition was at the disk pack level. In this stage, physical compatibility, price, and slow 2311 deliveries were the major objectives. During 1969, a number of organizations

carried the competition through the level of the complete drive into controllers, thus enabling users to contract for units which interface directly with I/O channels.

This last phase of development is very encouraging. In the past, users of IBM (or other manufacturers' equipment) have been in a weak position when trying to get maintenance on multivendor systems. Now that the disk can be bought with full controllers, these problems should be minimized.

Competition is available both in price and in performance. The

obvious leader in the latter area looks like the Ibmec Inc. replacement for the 2310, which has reduced average seek (head travel) time from 520 msec to 70 msec. Another manufacturer has approximately halved the seek time of the 2314, which should prove to be a major benefit to active users of the IBM unit.

### Key Entry

Keyed entry data units have proliferated more in numbers of suppliers than in types of units. The reason is obvious — the number of non-card input de-

vices that lend themselves to the keyed entry treatment is itself limited.

The major changes this past year have been in the applications geared to high-volume users. Key-to-disk (whether as intermediate or final precomputer form) has come into its own.

Disk is more easily sectorized into different areas for different operators; pooling is thus possible in separate segments for different types of input, if this flexibility is defined.

Thus phases into measurement of operator productivity and

supervision, which is far easier to gauge as identification of operators' work gets easier.

### COM

Computer output microfilm has been a long time coming, judging from the number of users grinding out huge volumes of library-type information by conventional photographic methods. These users have, in the past, been forced to convert to microfilm from the printed output itself, rather than being able to go directly from print image computer output tape, off-line, to microfilm storage.

## 1401 TO S/360 CONVERSION - FREE -

... if the TOTALTRAN translator does not physically translate at least 90% of your clean Autocoder source deck into System/360 Assembler Language without manual intervention.

### THE TOTALTRAN SYSTEM

is a unique set of proprietary software packages developed by CPU Management Advisory Corp.\* which enables you to convert your second generation programs into 100% operational System/360 programs quickly, efficiently and economically.

More specifically it will:

- Disassemble your patched 1400 series object decks into clean Autocoder source with meaningful labels.
- Disassemble your patched 7070 series object decks into clean Autocoder source with meaningful labels.
- Translate 1400 series clean Autocoder source into System/360 Assembler Language, under TOS, DOS, or OS.

### THE TOTALTRAN TRANSLATOR

Its tremendous efficiency is demonstrated by our offer to return the translated output of any program whose clean Autocoder source is not 90% physically translated without manual intervention (88-95 Free).

### 3 Service Options are available:

- to process your source deck through the translator
- to process to a clean assembly.
- guarantees an operational Assembler Language program.

### TOTALTRAN'S CRUISE DISASSEMBLER

The TOTALTRAN disassembler has been developed for both 1400 series and 7070 series programs, and is the most efficient and complete disassembler package in the industry.

### 3 Service Options are available:

- to process an object deck through the disassembler creating a new source deck with page and line type labels.
- to include label equates from an original assembly listing.
- guarantees operational source deck

**THE EXTREME EFFICIENCY OF TOTALTRAN'S PROPRIETARY SOFTWARE PACKAGES PERMITS CPU TO PUBLISH ITS FIXED FEE SCHEDULES REGARDLESS OF THE COMPLEXITY OF THE PROGRAMS TO BE PROCESSED. WITH OUR PUBLISHED PRICES THE CLIENT IS ABLE TO PERFORM HIS OWN COST ANALYSIS AND NOT BE SUBJECTED TO THE COST VARIABLES OF OTHER TRANSLATION AND DISASSEMBLER SERVICES.**

## IBM 7010 FOR LEASE

Additional 2nd and 3rd  
Generation Equipment  
Available

### COMPUTER LEASING COMPANY

2001 JEFFERSON DAVIS HWY.  
ARLINGTON, VIRGINIA 22202  
(703) 521-2500

## WE INVITE COMPARISON!

\*CPU Management Advisory Corp. is a wholly owned subsidiary of Commercial Programming Unlimited, Inc. a publicly owned company.

CPU MANAGEMENT ADVISORY CORP.  
853 Broadway, New York, N.Y. 10003  
Telephone: (212) 777-7722

### THE TOTALTRAN SYSTEM

Please send additional information, Brochure and Price Lists to:

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
PHONE \_\_\_\_\_ EXTENSION \_\_\_\_\_

Data processing Consultants to Government and Industry for over 5 years.



## the skilled data terminal for unskilled operators



Forget about keypunch girls or teletype operators. If your employees know their jobs, they already know how to use our new computer terminals.

Each machine has a mini-computer that we program to fit your business. It guides the operator step-by-step and "beeps" when a mistake is made. It can cut errors by 90 percent. It will search a

file, sort information, and copy records. The custom keyboard is simple to use. The video screen shows everything in familiar form for checking and editing. And it's all recorded on handy tape cassettes — no cards, no paper, no mess.

Our terminals work harder to make things easier for people.



**SYCOR inc**

## Year-End Review

# IBM Unbundling Biggest Software Event In 1969

By Peter L. Briggs

CW Software Editor

IBM's unbundling announcement certainly created the biggest furor in the software/user industry. Along with this announcement came a tremendous growth in software suppliers and announced packages.

Users have changed their thinking about the proper uses for outside software, and are still feeling their way through the new unbundled pricing from IBM.

All these factors, and several others including the IRS ruling on software capitalization, have made last year the most confusing and complicated, since the inception of the software industry.

### Unbundling Implications

Unbundling has accomplished several things. The most noticeable is that IBM has set a price on competitively developed software and application packages. Unbundling has also made most users much more conscious of the costs of software.

It was pointed out (CW, July 21) that user's expenses for data processing could increase by as much as 35%, should they choose to obtain all their software from IBM. This has caused most users to consider outside software more seriously.

The software industry, at first overjoyed by IBM's announcement, is now beginning to feel the pinch. IBM's sales force is a strong competitor to anyone, and IBM's recent software product announcements have shaken the industry with their low prices.

Even the service industry is hurting. IBM's own Service Bureau Corp. salesman have complained since the announcement of the Interactive Terminal Facility and the OS Time-Sharing Option. It seems that the Data Processing Division is making it very hard for anyone to compete with what IBM makes available for in-house users at a very low price.

Tied in to the unbundling announcement have been many reactions to the Internal Revenue ruling regarding the capitalization of software expenditures. If software is leased, as most of IBM's is, then it can be expensed.

If software is purchased, as most outside software is, then it must be capitalized. This presents an additional tax burden to the user who tries to make optimum use of his EDP budget through outside acquisition of software.

### Independent Software

The independent software companies have introduced a positive deluge of products during the year. Operating systems, application programs, programming aids, and languages represent the major areas where new packages are now available.

Several programmer aids, particularly in the area of improving the utilization of the machine and the operating system, were introduced.

Various packages, mostly for the 360, helped the programmer to bypass errors, trace the source of errors, and document his programs more quickly and more accurately.

Techniques such as decision tables, automated flow charting, and on-line debugging have received much attention.

The availability of packages through time-sharing services has increased substantially. This is the current technique for letting the user know that "We're the best!"

The independent suppliers have also begun to learn one of the major lessons about supplying software—you have to be able to both sell and support it.

Many smaller companies have run into serious trouble because they could not support their customers, and their customers complained.

This word-of-mouth business is really the only means of self-protection available to the user. He can either tell CW about his problems, or tell all his acquaintances about the problems he ran into.

With the proliferation of software offerings, it becomes harder and harder to evaluate the reliability of any given company.

### User Thinking

Though few (about 1,300) users are currently using outside software, many users have indicated that they plan to do so in the near future.

It was felt, by many of the users contacted, that the manpower shortage and the turnover rate were making it nearly impossible to retain the highly trained people necessary to develop good systems software or large applications in-house.

This change will certainly be a boon to the software market, long suffering from lack of attention. It does not appear, however, that there are too many new broad-based packages that can still be announced.

Over 3,000 packages are now competing for the user's dollars. Many of these are for payroll, accounting system, or inventory system use. Perhaps 80 different payroll packages are available, all with essentially similar features and vastly different scales of implementation effectiveness.

Services have sprung up, designed to help users evaluate both outside software, and the feasibility of developing packages in-house.

The biggest problem in this area is the age of the information available.

A given company could be excellent today, and be worthless next week due to a major staff turnover (this might be only one person, in some companies).



### 360 EQUIPMENT WANTED

IPS is interested in obtaining a number of 360 systems, CPU's, and components for customers. Among the systems wanted are a 360/400 CPU or system, a 360/501, a 360/95 CPU, and 360/30 32K and 65K systems and processors. Peripheral units wanted include 2311's, 2314's, 2540's, 1403's, 2821's, 2400 tape units and 2803/2804 tape control units. If you have purchased equipment you anticipate selling in the near future, please write or call.

**IPS**

INFORMATION PROCESSING SYSTEMS, INC.

467 SYLVAN AVE., ENGLEWOOD CLIFFS, N.J. 07632 (201) 471-4200

### PROGRAMMERS

Fast growing computer market research and consulting company has immediate openings for programmers with 2-3 years experience to take part in the implementation of data base oriented information systems.

Exceptional opportunity for persons with ambition and drive to take increasingly more responsibility. Salary depends on experience and performance. Send resume to:

John P. Breyer  
Vice President — Research  
International Data Corporation  
60 Austin Street  
Newtonville, Massachusetts 02160

## Parlez-vous COBOL?

It's the password to fast EDP career action with a banking leader.

Irving Trust Company — the country's 11th largest commercial bank — is offering attractive professional and monetary career packages to creative Systems Analysts who can develop new and improved concepts in today's dynamic banking industry.

*Specifically, Irving wants:*

**APPLICATION ANALYSTS** with several years' experience with third-generation hardware/software. A good knowledge of banking applications is essential, particularly demand deposit operations and installment loans. Experienced with dynamic file maintenance, retrieval and computer-to-microfilm techniques. Knowledgeable assembly language & COBOL and ISAM files.

**PROJECT ANALYSTS** with a minimum of (2) years' experience in DOS/360, or OS-MVT Systems. 2 years COBOL, or Fortran or RPG. Exposure to teleprocessing, ISAM files processing helpful. Experience in DDA, stock transfer, personal trust or securities analysis applications.

**ANALYSTS** with a minimum of (1) years' experience in DOS/360, COBOL, preferably with stock transfer or personal trust exposure. Knowledge 1401 SPS coding or DASD file processing.

Degree or equivalent business experience required for all positions.

Salary flexible depending on experience.  
Superior overall benefit & fringe package.

Send resume with current and desired salary to:

Mr. William J. Byman,  
Asst. Vice President, Personnel Division

**IRVING TRUST COMPANY**

One Wall Street, New York, N.Y. 10015

An Equal Opportunity Employer

## Development, Distribution of Dog Data Designed to Diminish Dognapping Danger

GILLETTE, N.J. — Watch that dog of yours, someone may be after it.

An estimated two million dogs disappeared last year. Many were victims of a nationwide ring of dognappers that peddles pooches to laboratories and hospitals for use in research.

"We believe that about 50% of the missing dogs were taken by dognappers," says Sal La Manna, head of the National Pet Registration Center in Gillette. His organization tattoos dogs painlessly and registers their identification numbers on a computer.

It also keeps an extensive computerized information system on the traffic in lost and stolen dogs.

A typical dognapper, La Manna explains, will furtively pick up a dog, remove his collar and tag, throw him in the trunk of a car, and drive off. Later he will take the dog along with other hapless pooches, to a secret out-of-state auction, where dealers will purchase other sauls for small sums obtaining bills of sale to legitimize their ownership.

Far from their owners, the same dogs will later be sold to laboratories for a going rate of about \$40 apiece.

To give a dog a permanent identity, La Manna's organiza-



Information on a dog's identity is fed into this Univac 9200-1 in effort to discourage dognapping.

tion marks it with the owner's Social Security number. This number, and the owner's name and address, goes into the memory of a Univac 9200-1 computer at the Capital Data Processing Corp., a computer service firm in Montclair, N.J. The computer can instantly furnish ownership information when it is needed.

La Manna has registered about 10,000 dogs since the computerized system was begun in 1968. Each dog receives a tag showing it has been tattooed. Its owner is given details, for display at his

home, telling potential dognappers that the animal has been marked with a permanent identification number.

La Manna has notified the 1,500 laboratories, plus state attorneys generals, police departments, dog pounds, and humane societies, of the dog registration system.

About 13% of the U.S. population owns dogs. La Manna says, and every day the paper continues to carry the news that some have disappeared, perhaps on the long sad journey which ends in the laboratory.

## Criminals, Stolen Property Registered At National Crime Information Center

WASHINGTON, D.C. — The long arm of the law can now reach farther, and faster, than ever before. In seconds, from almost anywhere within the U.S., police can find out important information about stolen property or wanted criminals

and make an arrest on the spot. This is accomplished with the assistance of an IBM 360/150 that the FBI has installed in its two-year-old National Crime Information Center (NCIC) here.

The system is hooked up with state and city police computers

in every state except Alaska. This involves over 1,800 local police departments through 90 regional control terminals.

**Transmits Police Data**

Data from each of these stations is fed into the NCIC memory bank at the rate of 40,000 pieces each day. Here it is processed and transmitted to any other requesting police department throughout the country.

Each police department, however, is responsible for entering crime statistics, maintaining them, updating them, and clearing them with the central processor when the crime has been solved or the criminal apprehended.

More than five million bits of information are maintained in NCIC's IBM 2314 disk files. Since local police handle their own minor criminal cases, details in the files are essentially of an interstate nature. Thus only information on those who have committed serious crimes or on property worth more than \$500 is entered on the computer.

Details of an individual include his sex, height, weight, date of birth, Social Security number and armed forces serial number. Files on property include data on automobiles, boats, guns, securities, and other stolen articles.

NCIC's purpose is a more comprehensive and faster exchange of police information. The system enables a policeman to query the memory bank and receive an answer within 30 seconds, even when approaching a suspect or stopping a speeding car.

## Everything for data processing... except the computer

### CARD STORAGE

The most logical and most practical card filing and handling systems available. Gold Star includes 15, 20 and 30 member filing bins to suit transfer bins.

### FIRE PROTECTION

Fireproof storage cabinets for protection of vital Line Data Bank Tapes. The only fireproof storage for tapes. 100" x 40" x 16" for safe storage of magnetic media.

### TAPES STORAGE

The TAPE SEAL system of hanging tape storage protects both belts and storage reels. Also, computer stored equipment for micro tape cassettes.

### TAPE CLEANING

A must of today's high packing densities. Single Line's Tape Cleaner employs an entirely new pulsing vacuum action principle for safe, gentle yet efficient tape cleaning.

**DISK PACK AND DISK PACK STORAGE**  
Complete Line Disk Packs with Disk Cover Surfaces plus full suspension drawer for tape and handling equipment.

### DATA COLLECTION

A complete line of portable card punchers for tape cards and plastic cards and output. Electric models plus mechanical printing and punching available.

Send coupon today for checking literature.

**It's Right**

WE GOLD STAR LTD. WORCESTER, MASS. • A DIVISION OF BARRY WRIGHT CORPORATION

Please send brochures checked below:

☐ GOLD STAR FILES ☐ TAPE CLEANER

☐ DATA BANK SAFES ☐ DISK-PACKS

☐ TAPE SEAL SYSTEM ☐ PORTABLE CARD PUNCHES

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_



# IBM SYSTEM/360 DOS AUTOMATIC COMPUTER UTILIZATION SYSTEM

## FEATURES

- AUTOMATIC RECORDING OF ALL PROGRAM EXECUTIONS IN BG, F1 and F2 DISPLAYED ON DAILY LOG.
- REPORTING ON ACTUAL PROGRAM RUN TIME INCLUDING WAIT (I/O), SUPERVISOR AND PARTITION TIME.
- IDLE TIME BY PARTITION IS RECORDED AND DISPLAYED.
- NON DOS ACTIVITY (DOWNTIME, P/M, BPS OPERATIONS, ETC.) MAY BE ACCOUNTED FOR AND RECORDED.
- AUTOMATIC COSTING BY PROGRAM EXECUTION FOR ALL COMPUTER OPERATIONS.
- MANAGEMENT REPORTS PROVIDE TIME AND COST OF PRODUCTION TIME BY JOB, PROGRAM AND SYSTEM.
- MANAGEMENT REPORTS PROVIDE TIME AND COST OF TEST TIME BY PROGRAM, PROJECT AND PROGRAMMER.
- DAILY LOG OF PROGRAM EXECUTIONS BY PARTITION PROVIDES METHOD OF OPTIMIZING THE SCHEDULING OF COMPUTER OPERATIONS.
- MAXIMUM OF 500 BYTES REQUIRED IN DOS SUPERVISOR.
- INSTALLED IN MORE THAN 50 COMPANIES IN 1969.

## PRESENTATION SCHEDULE

### JANUARY

PHILADELPHIA - MONDAY, JAN. 19  
BOSTON - MONDAY, JAN. 26

### FEBRUARY

WASHINGTON, D. C. - MONDAY, FEB. 2  
ATLANTA - MONDAY, FEB. 16  
NEW ORLEANS - WEDNESDAY, FEB. 18  
MIAMI - THURSDAY, FEB. 19

### MARCH

CLEVELAND - MONDAY, MARCH 9  
DETROIT - TUESDAY, MARCH 10  
ST. LOUIS - THURSDAY, MARCH 12  
HOUSTON - FRIDAY, MARCH 13

### APRIL

LOS ANGELES - MONDAY, APR. 13  
SAN FRANCISCO - WEDNESDAY, APR. 15  
SEATTLE - FRIDAY, APR. 17

### MAY

PITTSBURGH - MONDAY, MAY 4  
INDIANAPOLIS - TUESDAY, MAY 5  
KANSAS CITY - THURSDAY, MAY 7  
MINNEAPOLIS - FRIDAY, MAY 8  
TULSA - MONDAY, MAY 25  
DALLAS - WEDNESDAY, MAY 27  
PHOENIX - THURSDAY, MAY 28

### JUNE

PORTLAND - MONDAY, JUNE 15  
SALT LAKE CITY - WEDNESDAY, JUNE 17  
DENVER - FRIDAY, JUNE 19

**WCC**  
**WEBSTER COMPUTER**  
**CORPORATION**

1 PADANARAM ROAD  
DANBURY, CONNECTICUT 06810  
(203) 744-6500

WEBSTER COMPUTER CORP., 1 PADANARAM ROAD, DANBURY, CONN. 06810  
PLEASE RESERVE SEATING FOR \_\_\_\_\_ ATTENDEES AT YOUR  
PRESENTATION IN \_\_\_\_\_.

PLEASE SEND ADDITIONAL INFORMATION ABOUT YOUR DOS  
AUTOMATIC COMPUTER UTILIZATION REPORTING SYSTEM.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY/STATE \_\_\_\_\_

# COMPUTERWORLD 1970

Announces the First Special Industry Report

# SOFTWARE

Coming in the January 28, 1970 Issue

If your area of Responsibility is Software,  
its Sale or Purchase, you'll be interested  
in this Report.

Some of the Areas to be Covered:

## •Major Application Areas

Payroll                      Sales Forecasting  
Demand Deposit          Financial Modelling  
Certificate of Deposit

## •User Purchase Guidelines

For Software Suppliers

## •IBM Unbundling Effect

On Price Availability and  
in House Development Costs

## •Systems Software

Impact of New Languages  
Standardization

Operating Systems -  
Why?

Their Future  
What they can do for a user

## •Manpower Shortage

Effects on Software  
Development

## •Major Manufacturer

Support Services Costs  
Effectiveness  
User Value

•Where SOFTWARE is Heading in the next several years.

If you sell Software Products or Services,  
you will want to advertise to COMPUTERWORLD's  
over 30,000 subscribers who will read and keep  
SOFTWARE... Special Industry Report  
coming in the January 28, 1970 issue.

Special Advertising closing date: Wednesday, January 14  
5 P.M. E.S.T.

For more information about Rates and Mechanical  
Requirements, contact these COMPUTERWORLD Regional Offices:

National Sales Manager:  
Neal Wilder  
Sales Administrator:  
Dorothy Travis  
COMPUTERWORLD  
60 Austin Street  
Newton, Mass. 02160  
(617) 332-9806

New York City:  
Donald E. Fagan  
COMPUTERWORLD  
Suite 3G  
120 East 34th Street  
New York, N.Y. 10016  
(212) 532-1790

San Francisco Area:  
Bill Hesley  
Thompson/Hesley Assoc.  
1111 Hearst Bldg.  
San Francisco, Calif. 94103  
(415) 362-8547

Midwest:  
Bill Farrell  
COMPUTERWORLD  
Apt. 218  
25 East Chestnut  
Chicago, Illinois 60611  
(312) 944-5885

Los Angeles Area:  
Bob Byrne  
Sherwood/Byrne/Clarkson  
and Associates  
1017 N. LaCienega Blvd.  
Los Angeles, Calif. 90069  
(213) 657-6221

New England:  
Robert Ziegel  
COMPUTERWORLD  
60 Austin Street  
Newton, Mass. 02160  
(617) 332-5606

Dec. 31, 1969 - Jan. 7, 1970

Page 19

## 'ESP' Package Claimed Accurate Within 10%

Two new packages, a program for estimating source programs (ESP), and a project control system for program development (PAC), are being introduced by two companies to assist users in the operation of their DP facilities.

### ESP

The ESP program estimates the time necessary for each stage of program development, including coding, testing, and documentation, according to Computer Resources Corp., the developer.

Three levels of programmer experience and five levels of program complexity are used to input into the analysis, permitting almost any combination of circumstances and parameters for

analysis, according to the company.

Various rates, ranging from \$5 to \$15 an hour are used to estimate development costs.

The package, selling for \$400, includes documentation and operating instructions. The unit of measure used is one source statement. ESP, the company says, "has proven accurate to within 10% on the number of source program statements required to code all programs tested to date." If the statement/man-hour rate is known for a given installation, simple alterations will permit the program to make use of these rates. Otherwise, built-in rates, based on nationally collected data, will be used, the company says.

ESP operates on S/360 under either OS or DOS and is currently running on systems ranging from the Model 30 under DOS through the Model 65 under OS/MVT-ASP (attached support processor).

Current users include Braniff International, Oak Cliff Bank and Trust Co. of Dallas, and the Republic National Bank of Dallas, according to the company. Computer Resources Corp. is located at the Meadows Bldg., Dallas, Texas.

### Project Control

Project Analysis and Control (PAC) sells for \$7,500 and runs on a 32K or larger computer, according to International Systems Inc. The system stores and

maintains information on all projects and sections of projects currently underway.

Information to assist in the time and cost analysis of project completion is provided through nine reports. Specific reports include departmental loading, program history, programmer's ef-

iciency reports, and total project time cost.

Periodic progress reports are produced, as well as time analysis reports for management.

International Systems Inc. is located at the Continental Arms, King of Prussia, Pa.

## SDC Offers \$350/Mo 360 Data Management System

SANTA MONICA, Calif. - A \$350, S/360-oriented interactive data management system, the first in a series of data management systems from Systems Development Corp., was announced recently.

The package runs on any 360/30 or larger computer with at least 32K, and operates under DOS, the company says. It can use either 2311 or 2314 disk storage devices, and uses completely 360-compatible data-coding and files.

SDI can handle many different types of files, including personnel files, financial records, inventory data, municipal records, real estate listings, and

medical records, the company says.

The retrieval and command language employs standard English phrases, and all responses are also in English. No knowledge of computer programming is needed to retrieve or reference data stored under DS/1, the company says.

Information including record-selected counts, printouts of selected records, and printing of selected information within selected records can be produced with the system.

On-line update and error validation are fully supported, the company says. The company's offices are located here at 2500 Colorado Ave.

## Time-Share Decision Application Packages Operate on GE Mark II

KING OF PRUSSIA, Pa. - A series of management decision time-sharing applications packages, is available from Time-Sharing Enterprises Inc.

Along with the applications packages, the company provides training and documentation, according to Alan G. Hamner-Smith, company president.

The packages are available both to time-sharing vendors and to users on a purchase, lease (yearly or monthly) basis. The applications are presently operational on the GE Mark II system and are written in Fortran. Hamner-Smith said that the company is

in the process of converting the packages to a variety of time-sharing systems.

The packages include Equipment Replacement Model, Lease-Buy Analysis, Statistical Cost Control, Mergers/Acquisitions (not available until 1970), Probabilistic Cash Flow, Decision Tree, Economic Order Model, Business Projections, Line of Balance, and Depreciation.

The purchase price of the available packages is \$3,000, except for Business Projections, which is priced at \$6,000. A yearly lease is \$1,000/year a monthly

lease is \$100/month. Business Projections leases at \$2,000/year and \$200/month.

Time-Sharing Enterprises Inc. is located at 251 W. DeKalb Pike, Suite C-110, here.

## New Clinical Program From IBM May Reduce Hospital Laboratory Workload

WHITE PLAINS, N.Y. - A \$250/month program that is said to help reduce clerical work in hospital laboratories and speed clinical test reports to doctors has been announced by IBM.

The new program product, called Shared Laboratory Information System, organizes doctors' orders for tests, validates the results and directs a 360 to print test reports and post changes to patients' accounts.

The program can be used by a single hospital or by several hospitals sharing a central computer. In a shared system, each hospital would use its own test procedures and would have access only to its own information.

Hospital can tailor the system by putting their individual requirements into a master data file that the program would use as a reference for clinical test procedures and report formats, according to the company.

"Doctors' orders for clinical tests are transferred to punched cards and entered into the computer. The program issues a master list of pending tests, a schedule of specimen collections and laboratory worksheets specifies whether tests should be performed separately or performed simultaneously with automated instruments.

Results are automatically validated against limits established by the hospital and stored in the master data file. Results exceeding the limits are flagged for review by a doctor.

About 20 types of reports can be produced, including a month-

ly statistical analysis of all laboratory test results and daily summaries of tests performed and tests pending, the company said.

Charges can be posted to patients' accounts either at the time tests are ordered or when they have been completed, depending upon the hospital's procedures.

The program is compatible with IBM's Shared Hospital Accounting System (Shas) and operates with standard Shas executive routines. Hospital admission

procedures, master files, record formats and management reports are common to both programs. Shas was available from IBM before the company's separate pricing announcement last June and remains available at no charge, according to the firm.

The Shared Laboratory Information System operates with 360 Models 25, 30, 40 and 50 under DOS. The program is scheduled to be available in the third quarter of 1970 at a monthly charge of \$250, under a license agreement.

## Payroll System Includes Four Time Report Types

VALLEY STREAM, N.Y. - A third-generation payroll system designed for the IBM 360/30 and under DOS, is being offered by Computer Procedures Corp.

A minimum of 32K of memory including supervisor is required to run the system, which is either disk- or tape-oriented (two tape drives are required for tape-oriented systems). The system is programmed in Bal assembly language.

The eight transaction inputs of the system include new companies, new employees, file updates, and special payment cards. After conversion, only two forms are needed for input, claims the company.

Four types of time reporting are included: regular time, overtime, shift time, and the unlimited company-defined special time such as vacations and unauthorized periods.

The payroll system includes labor distribution breakdown at

time card level, four pay periods, payment calculations, tax calculations, voluntary deduction calculations, quarter-to-date accumulation, year-to-date accumulations, and modular design provisions, the company says.

Fifteen other features of the system include unlimited number of checks for each employee, automatic deposits, automatic savings account deductions, and automatic payments.

The price of \$5,350 for the system includes complete systems and programming documentation, on-site customer orientation and instruction, installation assistance, and a 90-day guarantee against program or system errors. Optional systems maintenance for one year is an additional \$950. Leases may be negotiated.

Delivery and installation takes 30 days, according to the firm. Computer Procedures Corp. is located at 181 South Franklin Ave.

## 'Tridem' Assists Surface Plotting

BELLAIRE, Texas - Houston Instrument adds to its line of applications, plotting software with the announcement of the Tridem three-dimensional plotting package.

In an effort to provide the user of Complot plotters and plotting systems with a full range of plotting software, the company has developed the Tridem package.

This package has been designed to incorporate most of the features currently offered by other 3-D packages and to be priced at a price substantially less than current competitors, according to the company.

The package is said to offer versatility in plotting a gridded array in three-dimensional space. Some of the features of the software package include the representation of stereo pairs, hidden line capabilities and approximation of curve-linear

shapes.

The package is written in the basic Fortran IV language and can be installed on almost any computer system, the company says. The package will support the entire line of HI plotting systems (on-line, off-line and time-shared). The package requires approximately 3,500 words of core and runs in conjunction with the company's basic software.

The user communicates with the three-dimensional system by supplying parameters to the six basic Fortran subroutines with a small payment for lease renewal, according to the firm.

Delivery of the Tridem plotting system began on December 1. The system is leased for a one-year basic term with a small payment for lease renewal, according to the firm. Houston Instrument Division of the Bausch & Lomb is located at 4950 Terminal Ave.

**SUBSCRIBE TO  
COMPUTERWORLD**



For Decision-Makers...

## QUICK COMPUTER COMPARISONS!

Performance • Trade-offs • Prices

The definitive reference guide to 1,354 computers, peripherals, system components and services from 1,658 suppliers (with 23,000 listed sales outlets).

### 436 Hardbound Pages

Trade-Off Analyses: 63 pp.  
Comparative Performance Charts: 126 pp.  
Product-Service Directory: 108 pp.  
Manufacturer-Sales Outlets: 112 pp.

To: Dept. 14, COMPUTER INDUSTRY ANNUAL  
Box 258, West Concord, Mass. 01781

Ship promptly \_\_\_\_\_ copies of the new 1969-70  
COMPUTER INDUSTRY ANNUAL (© \$18.50 plus \$1.50  
handling unless full payment accompanies this order).

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Zip \_\_\_\_\_

Purchase Order # (if any) \_\_\_\_\_

- ☐ Bill later, plus \$1.50 for handling  
☐ Payment enclosed. Ship prepaid.



"...This is a Recording... Your Program Cannot Go Through as Dialed... Hang Up  
and Dial Again..."

## Terminal Frees Computer For Programmer Scheduling

PRINCETON, N.J. — An in-house terminal system is said to give programmers computer access when they need it, not at the discretion of the operations section.

Applied Data Research Inc. has developed Roscoe (Remote OS Conversational Operating Environment) so that programmers can create, test, and maintain programs without taking "a back seat to production jobs."

The online real-time system operates on IBM 360 Models 40 and larger, requires 64K of core memory, runs as a conventional job under OS MFT or MVT, runs concurrently and without interfering with normal batch processing, and supports remote devices including IBM 1050s, 2741s, 2260s and 2265s.

With Roscoe, programmers working at remote terminals can enter source programs and test data directly into Roscoe's disk library. Information stored in the library can be maintained, manipulated and displayed at a terminal by statement or by file.

"An editing feature permits characters or phrases within source statements to be deleted, inserted or replaced."

Optional features available are syntax checkers for JCL, Cobol, Fortran, PL/I program validation which can be activated by a terminal user. The additional charge is \$100 a month for each syntax checker.

A conversational procedure facility permits a programmer to execute a series of stored Roscoe commands which build JCL statements and automatically combine library statements and files into valid OS job streams, according to the firm.

Individual programmers can compose

Roscoe procedures (Rosprocs) at a terminal; or one installation can prepare standardized Rosprocs for all terminal users.

Remote scheduling of compilations and program tests can be accomplished with Roscoe. Compilations and tests are placed in a special OS job queue and are processed automatically or under control of the computer operator, the company said.

Diagnostic output of Cobol, Fortran, PL/I, and Assembly compilers and the source statements generating the diagnostics are delivered to the terminal at the programmer's request.

Samples of problem program or utility output also can be displayed in either report or dump format. The output from each step in a multitask job is logically organized so that each set of output can be conveniently retrieved, according to ADR.

In addition to the terminal facilities, large volumes of output can be directed to a high-speed printer.

The one-time installation and training charge for Roscoe is \$2,000. Roscoe is available for delivery at a lease price of \$1,000 to \$1,500, depending on the selected options. Maintenance is included in the price, according to a company spokesman.

Training courses for applications programmers and operations personnel are offered as well as evaluation and correction of reported malfunctions. Documentation available includes a user's guide. A system programmer's guide for OS will be available later, reported a company spokesman.

Applied Data Research Inc. is located at the Route 206 Center.

## Tymshare Improves Languages With Super Fortran and Basic

PALO ALTO, Calif. — Three improved software languages for time-sharing subscribers have been introduced by Tymshare, Inc.

A new language, Super Fortran, was introduced as an expanded super set of Fortran IV. Its features include 360/Fortran II compatibility and syntax and command mode extensions. In addition, Super Fortran offers random access files, faster program execution, more efficient data storage allocation, and string processing, the firm said.

Tymshare's Super Basic also been developed to provide faster program development with a wider range of applica-

tions and the elimination of I/O restrictions for faster execution speeds. Super Basic's features include a production optimizer, random access files, incremental compilation, and immediate error diagnostics for rapid program development, the company says.

A new version of Editor also has been introduced which will provide a capacity of 6,000 lines or 360,000 characters in upper and lower cases. In addition, Editor, can now provide direct communication with Batch Fortran, and has an expanded FIND command that may be used with SUBSTITUTE and WRITE.

Tymshare Inc. is located at 525 University Ave., Suite 220.

MEDICAL  
DATA  
CENTER



"Before I Accept Your Diagnosis I'd Like to Consult Another Computer..."



## TOTAL...

### The Data Base Management System

A positive and evolutionary approach to the data base MIS!

TOTAL features a data base definition language and a data manipulation language which function at the call level with any IBM host language.

TOTAL with over ten user years of experience by some of the largest companies in the world, has proven to be the tool which positively solves the major problems to MIS implementation.

TOTAL has a minimum design level for IBM System/360 equipment of 32K and 2 disk units and functions in multi-programming and terminal based environments.

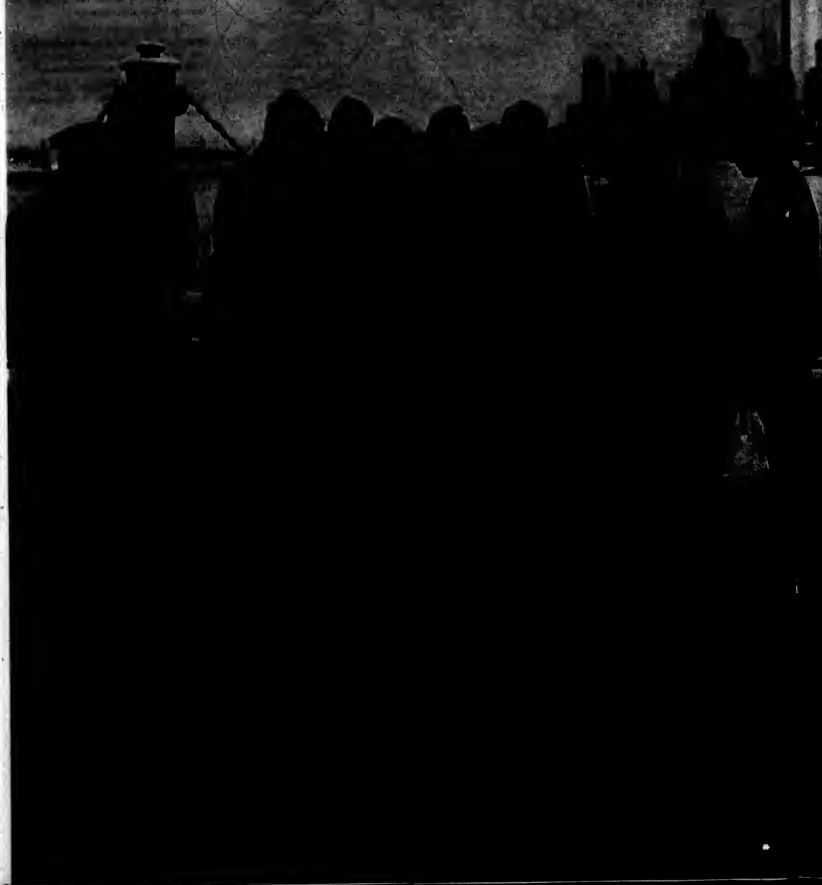
TOTAL will help you move years ahead in a matter of months. It only takes a minute to contact us:

### CINCOM SYSTEMS, INC.

2181 Victory Parkway  
Cincinnati, Ohio 45206  
IS131 961-4110

# The unrehearsed Keynote Demonstration

On land, on the sea, on the air, we'd like to prove that Keynote units work as well as we say they do. By showing them *live*. (Without a lot of rehearsals standing by to make sure everything goes smoothly.) Look closely.



But Keytape communicate,  
variable check digits, add, list, or  
pool.

Watch the way Keytape prints  
not hard copy records.

When you advertise  
this is a copy of those  
who have problems.

But we have them in operation.

Now:

Which is the difference between  
an act and a performance.

If that's your kind of show, give  
us a call.

We'll like to audition for you.

\*Registered at Honeywell Inc.

The Other Computer Company:  
**Honeywell**



## Is there a Teleprinter Serviceman in the House?

You can get one—quick. Just dial (800) 963-8000. At extension PH-311, you'll get all the facts about RCA service: contractual, per call, or emergency. Coast-to-coast service is offered by RCA for the account of the manufacturer and large user. Check on it. Phone today, or if you prefer, write RCA Service Company, A Division of RCA, Bldg. CHC-225, Camden, N. J. 08101.

**RCA**

## Instant Response Generated to Scholarship Enquiries

HARRISBURG, Pa. — Pennsylvania college students asking about their state scholarship are getting practically immediate response to telephone inquiries.

The quick action is made possible by the visual display of computer records on TV-like screens at the Pennsylvania Higher Education Assistance Agency (PHEAA) administrator of the state's two big scale aid-to-students programs.

The agency is using 16 visual display terminals hooked up to an IBM 360/40 to keep up with the records and inquiries involved in its \$51-million scholarship program and \$160-million guaranteed loan program.

The visual display terminals have a keyboard which agency personnel can use to have any

one of the one-quarter of a million student master records flashed in front of their eyes in a matter of seconds. From data displayed on the screen, the operator can answer a student's query while the student is still on the telephone.

### Scholarship Applications

PHEAA's computer plays the key role in determining scholarship recipients and the amount of their awards. Stored in the computer's files are the educational costs at all of the more than 3,000 institutions of higher education throughout the nation that Pennsylvania's scholarship recipient may attend.

As scholarship applications are received, information about the financial status of applicants and their families is fed into the files.

The computer then performs an intricate "need analysis", checking the student's financial resources against costs at the school he wishes to attend. If the difference between resources and costs is greater than \$200, the student is awarded a scholarship of up to \$800.

While need analysis results are ordinarily printed out by the computer in bulk runs, a need analysis can be requested through the visual display system. The results, awards and amount, or rejection and reason, are immediately shown on the screen.

The visual display system becomes critically important in time saving when applications are incomplete or incorrect. Upon receipt of new information, it is entered directly into the com-

puter files through terminal keyboards. The changes in the master record appear on the screen, and the operator knows immediately if it is complete, or if more information must be obtained.

The same procedure is followed if a student changes his plans or his status. He can notify the agency and have various alternatives, such as a different choice of school, entered into the computer. The computer then calculates the effect such changes would have on eligibility and immediately displays the results back to the terminal operator.

This academic year, PHEAA's computer system coped with a flood of 125,000 scholarship applications and selected 82,000 of the applicants to receive these awards. At the same time the system is keeping track of about 90,000 students who have guaranteed loans, some of whom have two or more. This year alone, the agency has guaranteed 42,000 loans.

### Many Inquiries

The two massive programs result in a torrent of inquiries by telephone, letters and personal visits by students, their parents, state and school officials and state legislators.

Kenneth R. Recher, PHEAA executive director, refuted contentions that use of the computer has eliminated the "human touch." On the contrary, he said, "The system helps our financial aid specialists by handling thousands of record keeping details and calculations automatically, allowing the specialist to concentrate on situations requiring individual attention."

In addition to operations associated with scholarship and loan processing, the agency utilizes its computer system to record correspondence and how it is handled, to compose and write some letters, to administer budget control, and to compile a mass of statistical data on scholarships and loan recipients and the schools they are attending.

The agency has coordinated its computer records with the Pennsylvania State University, the school with the most scholarship recipients. Coordination is expected to be extended to other colleges and universities in the state with computer installations.

Other future plans include installation of visual display terminals in the 13 agency regional offices spread throughout the state.

# FASBAC FORTRAN is the Eraser's edge!



FASBAC FORTRAN is a new remote computing service that provides the working engineer with two very practical benefits: first, through FASBAC, it provides unrestricted access to the full speed and power of an ultra-large computer in a University Computing Company center via an on-site terminal that can be as small and inexpensive as a teletypewriter. Second, it enables him to write, check-out, debug, and run a FORTRAN program of virtually any size in direct communication with a central computer. No coding sheets to fool with. No arbitrary restrictions on length. And FASBAC FORTRAN conventions make code creation and entry much easier and simpler. FASBAC combined with FORTRAN V puts a powerful new tool in the hands of those technical executives who need to create problem statements rapidly in FORTRAN and have them processed swiftly on large-scale computing equipment. FASBAC FORTRAN can bring unlimited computing capability into your own office, as it combines the best of two worlds: time sharing and remote-batch processing.

If you use FORTRAN in your daily work, you can uncover a new dimension of computing power and convenience with FASBAC FORTRAN. For more information on this important new development, write or call FASBAC, University Computing Company, 1949 Stemmons Freeway, Dallas, Texas 75207, (214) 741-5781.



Suggested by debugging and coding sheets? FASBAC's the answer.

**FASBAC FORTRAN**



**UNIVERSITY COMPUTING COMPANY**

Corporate Offices: 1300 Frito-Lay Tower / Dallas, Texas 75230

Computer Utility Centers in: Dallas, Houston, Kansas City, Los Angeles, New Orleans, San Francisco, N.J., Palo Alto, New York, Tulsa, Denver, Chicago and Boston







COMPUTERWORLD

## education

## Franchised Computer School Sues Computer Environments

BOSTON - Charging noncompliance with the terms of a franchise agreement, Computer Applied Resources, Inc., Braintree, Mass., has filed suit to recover in excess of \$30,000 from its franchisor, Computer Environments Corp., Hanover, N.H., a subsidiary of Time Share Corp.

A Time Share spokesman said his company had no immediate statement but that a statement would be issued in the near future.

Filed Dec. 1 in Suffolk Superior Court, the suit claims that in July, 1969, Computer Environments granted "an exclusive franchise to the Plaintiff for the operation of a Computer Environments Center, a school for the training of computer program-

mers." But the defendant had, it said, "failed to perform or do those things required of it under the terms and conditions of the said agreement."

Computer Applied Resources charges that the defendant agreed to provide services, including an operations training program, assistance in procuring students, financial advice, help in site selection, and instructional materials.

The Braintree firm alleges that these representations induced its entrance into the franchise agreement, but that Computer Environments advanced the statements "with the knowledge of their falsity."

A court spokesman said that it could be as long as a year before the case came to trial.

smtwfs *calendar* smtwfs

Jan. 7-9, Norwalk, Conn. - A course entitled Business Forecasting covering the design and implementation of forecasting systems, presented by Turnkey Systems Inc. Also, on Jan. 12-14 and again on Jan. 21-23, a course on Computer-based Manufacturing Planning & Control Systems. Contact: Joseph L. Barnett, Turnkey Systems Inc., 111 East Ave., Norwalk, Conn. 06851.

Jan. 12-13, New York - Computer Lecturing Co. is presenting a course on How to Use Computers Creatively. Contact: Computer Lecturing Co., 30 E. 60th St., New York, N.Y.

Jan. 12-14, Atlanta - A meeting concerning the Mark IV User Group (IV League). Contact: R.D. Stone, Informatics Inc., 5430 Van Nuys Blvd., Sherman Oaks, Calif. 91401.

Jan. 12-16, Los Angeles - The American Management Association is presenting courses on Finance and the Computer, (1529-61), and Basic Data Processing for Non-EDP Executives (6508-73). Contact: Course Registration, AMA, AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.

Jan. 14-16, Tampa, Fla. - The Third Annual Simulation Symposium. Contact: Annual Simulation Symposium, P.O. Box 1155, Tampa, Fla.

IMMEDIATELY AVAILABLE

### 1316 DISK PACKS

MANUFACTURED BY

IBM

REDUCED PRICES

SALE OR LEASE

SHORT OR LONG TERM

ALSO SYSTEM 360'S AND

UNIT RECORD FOR SALE OR LEASE

CONTACT JOSEPH McALUNEY

**CONTINENTAL COMPUTER ASSOCIATES (N.Y.), INC.**

 Cedarbrook Mall, Wynnton, Pa. 19095  
 Telephone 215-885-2525

## ECPI Proposes Proficiency Exam

NEW YORK - A uniform, nationwide proficiency examination for all entry-level programmers has been proposed by Sidney Davis, president of the Electronic Computer Programming Institute (ECPI).

The test would seek to provide an objective technique for measuring the competence of all job applicants regardless of their previous education and training.

Davis sees the move as a step toward opening wider a job market habitually cornered by grey-suited, college-educated math majors.

"In short, too many people responsible for hiring data processing personnel cannot objectively interview and hire programmers with less than a college degree," he explained.

He cited frequent industry criticism of data processing school graduates and countered, "... [W]e have proved that men and women from a wide variety of backgrounds can learn to program computers for business and industry with intense professional, curriculum and training."

It is hoped that, faced with the prospect of preparing students to pass a standard test, computer schools would be motivated to upgrade their curricula and teaching staffs to insure providing the requisite level of ability.

At present, he said, there are no plans to make the results from various data processing schools available to prospective students to aid in the school selection process.

Davis suggests that the exam's contents be determined by a representative group of manufacturers, users, employers, and educators. "Our current timetable calls for organizing [such] a group by the middle of February," he added.

### Society Involvement

Administration of the exam, he hopes, would be undertaken by one of the professional societies, such as the Data Processing Management Association or the Association for Computing Machinery.

Davis likened the program to the Bar exam given to law school graduates and CPA exams for accountants seeking certification, with the tests being given at preset times in a central location.

**\$1495.**  
**\$1495?**  
**\$1495!**



We kid you not. That's our price... unbelievably low—without a micron loss of quality or efficiency. Our philosophy's simple: no over-engineering, no idle parts sitting—and costing—till user requirements catch up. No wonder our display terminals lead the entire field in price-performance. For further details, write for our free brochure or call collect.


**Infoton**

 Infoton Incorporated, Second Ave., Burlington, Mass. 01803; (617) 272-6660  
 Incorporating Information Research Associates, Inc.

## Growing IACP Outlines Projects

SYCAMORE, Ill. - The International Association of Computer Programmers, Inc. (IACP), a recently formed nonprofit organization [CW, Oct. 15], now has 13 member chapters, one satellite student organization, and plans for an international membership meeting in June, 1970.

According to its organizers, IACP is designed "to reflect the professional stature of the computer programmer in society and, through effective two-way channels of communication, remain alert to his opinions and needs."

The scope of the group's activities has been refined, with the following scheduled for implementation in 1970:

- A monthly magazine featuring

articles on programming languages, techniques, and the programmer's relationship to his company.

- A monthly newsletter to inform the membership of the progress and upcoming activities of the organization;
- Scholarship, loan, and work-study programs for continued education in the programming profession;
- Educational seminars, lectures, and exhibits;
- Publication of education materials, and
- State, regional, national, and international membership meetings.

Lawrence M. Vanucci of Computer Advisers to Management has been named president of the

group. Richard T. Lynch has been appointed executive vice-president; and Donald J. Spapieri is vice-president of finance and treasurer.

Three membership classifications are available. "Active" members must periodically perform computer programming in their occupation. Affiliate memberships are available for those who do not program, but have a professional interest in data processing. Student memberships are available for those engaged in many forms of computer education.

The group is not working in conjunction with any other data processing society. Additional information is available from the society at P.O. Box 57, Sycamore, Ill. 60178.



COMPUTERWORLD

## societies

### EDP Honorary Initiates Chapter at Penn State

By Kate Rachstein

Civ. Education Editor

COLLEGE STATION, Texas

Upsilon Pi Epsilon, an honor society for students in computer science, founded at Texas A&M University in 1967, has installed a second chapter for 33 members at the University of Pennsylvania.

A third school, the University of Southern Louisiana, is con-

sidering establishing a TIE chapter. Prospects of forging the organizations into a national body are now greatly increased, according to Dr. Dan Drew, A&M professor and TIE advisor.

#### National Congress Planned

When five chapters have been installed, the society hopes to call a convention to determine a national structure, a TIE officer said. A proposed national constitution and by-laws already have been drafted by members of the Alpha chapter at A&M.

In addition to encouraging high scholarship, TIE goals include recognizing individual contributions to data processing, providing an environment of growth for computer science, representing computer science in interdisciplinary communications, and maintaining professional standards.

Alpha chapter president Dan Galvin noted that the requirements for individual student membership generally will be set by the local body. Although usually, he said, the requirement is that a student have completed more than one semester and be in the upper third of his class.

#### Chapter Requirements

Qualifications for chapter status include:

- Satisfactory course offering and degree requirements in computer science by the school.
- A petition by eligible students and graduates stating their desire to affiliate and expressing willingness to subscribe to the constitution and by-laws of the association and to work toward the formation of a national association.
- Certification that the petitioning students are eligible for membership under the proposed constitution.
- A proposed constitution and by-laws.
- Additional information about the composition and organization of the proposed chapter.

Students interested in organizing a Upsilon Pi Epsilon chapter on their campus may obtain additional information from Dr. Dan Drew, Data Processing Center, Texas A&M University, College Station, Texas 77840.

#### CONVERSION

Attempting a conversion? Our highly skilled and professional staff, with extensive experience in all phases of conversion, is available to assist you in this task at a cost to fit your budget. CONTACT:

COMPUTER BUSINESS APPLICATIONS, INC.  
Suite 1434  
Land Title Building  
Philadelphia, Pa. 19101  
PHONE 215-663-7676

# Big banks, little banks, XiOX Sav-A-Matic Software fits the need & the budget.



One of the larger banks in the country, with assets in excess of \$1 billion, uses XiOX financial software.

So does Continental National Bank of Phoenix with assets of \$32 million.

Both use the XiOX "Sav-A-Matic" package, which is the result of thousands of man-hours of work by experts. Sav-A-Matic is programmed in COBOL for IBM 360, RCA SPECTRA 70, and Burroughs 3600 and 5500 systems, with every facet of processing, accounting and management information reports for C.D., T.D., Open Account and Regular Savings.

Obviously the large national bank has the know-

how to do its own programming. And just as obviously, Continental National has to budget with a sharp pencil.

Why should they both choose XiOX software? Because you couldn't write a better program yourself for \$100,000 - and the XiOX price tag is only \$12,600.

Completely flexible to fit variable interest rates, ledger standards and report dates, any time period and variable pay methods, and best yet: the Sav-A-Matic Software package requires operator intervention only for form changes.

A smart bank near you is using XiOX financial software. Ask us... then see for yourself. Call or write today. XiOX Sav-A-Matic is ready to go when you are! Call Ted Dela Court, Dept. CW31, 8101 Biscayne Blvd., Miami, Florida 33138 • Phone: 305/758-1839

**xiox**

INTERNATIONAL INC.  
Miami, Florida

Dec. 31, 1969 Jan. 7, 1970

Page 27

## 'Design Economies' for Computers Lead To Performance-to-Cost Improvements

WELLESLEY HILLS, Mass. — The general manager of Honeywell's Information Data Processing Division predicted that technological "design economies" now being developed for computers will lead to dramatic performance-to-cost improvements for many hardware components during the 1970s.

Robert P. Henderson, vice-president and general manager of Honeywell EDP, said the performance-to-cost of the basic building blocks of computer central processors, logic circuits and memory will show the most dramatic improvements.

He said performance of logic circuitry compared to its cost is expected to increase at least five fold by 1975.

At the same time, he said, the speed of main memory will increase while the total cost per memory bit drops by a factor of at least three by 1975.

In a year-end statement, Henderson said, "These cost and capability trends in the electronic logic and memory areas will make possible construction of computer hardware with increasing capability, complexity and power."

"For example, instead of packing all the processing capability into the central processor in the computers of the future, the processing power will be distributed throughout the whole system."

"Terminals and other peripherals with their own logic and memory will become commonplace, simplifying the task of the central processor and increasing

the total efficiency of the system."

"Most important," Henderson said, "these design economies will allow computer manufacturers to offer the user a variety of techniques to obtain great efficiency and reliability while receiving much improved computing power."

"The current trend toward bigger, faster and more complex machines will continue and accelerate in the 1970s."

"However, since a far greater portion of the operating system

will be handled by logic in each of the various parts, the total system will not become unwieldy or unworkable."

"In addition, many systems will be so organized that if one processor or peripheral fails, it may be automatically cut out of the system until repaired, thus eliminating total failure."

"These developments come from an evolution of present technology as well as from new technology moving from the laboratory to the user's facility," Henderson said.

## GE Adds Two Service Districts

MOUNTAINSIDE, N.J. — Two new field service districts have been established by GE's information systems sales and service field engineering department.

The new services represent a move to better serve GE computer customers and to improve the ability to serve future customers in the New York-New Jersey area.

The new suburban and the metropolitan districts replace the former New York district. The suburban district includes all FED sites in northern New Jersey plus West Point, N.Y., while the metropolitan district covers the New York City-Long Island area.

Named to new positions are Will R. Evans to head the metropolitan district with offices at 641 Lexington Ave., and Billy T. Adams, manager of the suburban district with offices at 250 Sheffield St., Mountainide, N.J.

Evans has been a field service manager in the New York district for the past three years. Adams has been manager of maintenance operations for the eastern region for the last three years.



## Trade Shorts

Bradford Computer & Systems, Inc. has a new five-year agreement with International Paper Company, extending the present contract under which Bradford manages and operates IP's corporate computer data center in New York City.

Keydata Corp., of Watertown, Mass., and AGT Data Systems Limited, of Toronto, Ontario, have signed a licensing agreement which gives Keydata Canada, a newly-created division of AGT, the exclusive right to market and provide Keydata's on-line business data processing services in Canada.

Booth Resources International, Inc., 3435 Wilshire Blvd., Los Angeles, has been appointed dealer in the western U.S. for computers and peripheral equipment manufactured by Viatron Computer Systems Corporation. Marketing will be handled out of BRI offices in Los Angeles, San Diego, San Francisco, Sacramento and Olympia, Washington. Demonstration of Viatron equipment and training is offered at all offices and at the new BRI Computer Resource Center, 3550 Wilshire Blvd.

Especially when it comes to digital data. The new Bell & Howell DIR-6100 Incremental Digital Magnetic Tape Unit can be used to read and write digital information in any system that now employs punched paper tape. The instrument offers several important advantages.

**Speed, performance.** Data is written incrementally from 0 to 150 steps/second (as opposed to paper's 80 steps/sec) and is read continuously at up to 3000 characters/sec. **Economy, convenience.** Magnetic tape can be used hundreds of times, paper only once. The

tape is in cartridge form, so you simply change it in seconds without threading or reel loading. Thus, lower operating and maintenance costs. And you pay little more than for a paper-tape system.

**Versatility.** Up to seven channels of information can be recorded. Read and write functions are selected automatically or by remote control. The unit is also available in read-only or write-only versions. The DIR-6100 is easily interfaced with any digital system.

For all the facts, call our nearest office, or write Bell & Howell, Pasadena, Calif. 91109. Ask for Bulletin Kit 3352-X2

CEC/DATA INSTRUMENTS DIVISION

**BELL & HOWELL**

# You can forget about Graham tape.

## We make it that way on purpose.

The way we look at it, an EDP manager shouldn't have to worry about tape.

Tape ought to perform perfectly, every time. It ought to be good for a million passes at least.

It should have no defects at all. Especially no rub-off. And of course every reel

ought to be certified 100% error-free by its manufacturer.

Come to think of it, that sounds exactly like the tape we make at Graham.

But our tape, as good as it is, is really just a means to an end. Dependability is what we're really selling.

Just think about it. Wouldn't

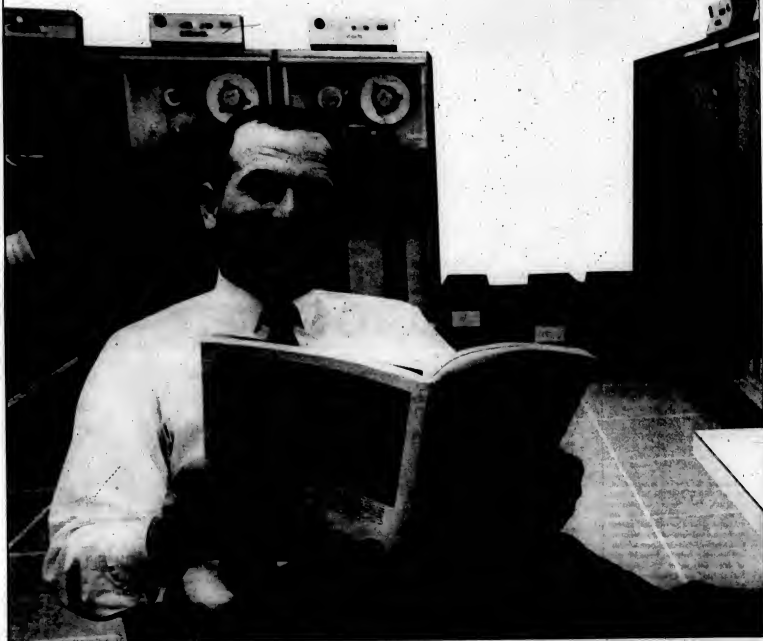
you like to forget about tape? Then remember Graham. Just long enough to give us your order, and to get it in your system.

Then forget about it.



**GRAHAM  
MAGNETICS**

*means to an end.*



Graham, Texas 76046

WATS Phone 800-433-2701

Texas Phone 817-549-3211

## Acquisitions

**Venture-Data Corp.**, Conshohocken, Pa., and **Drexel Data Systems, Inc.**, Philadelphia, a data processing software and consulting firm, have reached a merger agreement whereby Drexel Data Systems will become an operating division of VDC.

**Raytheon Co. and Visual Electronics Corp.**, New York, have reached an agreement in principle on the purchase of Raytheon's electronic learning systems business by Visual Electronics. Under terms of the agreement, Visual Electronics will assume the inventory, receivables, and on-going business of the Raytheon Learning Systems Co., Michigan City, Ind. Raytheon will receive 100,000 shares of common stock, 15,000 shares of convertible preferred stock, and \$15 million in 15-year promissory notes.

**Chicago Tabulating Service, Inc.**, Chicago, a wholly owned subsidiary of Data Processing Development Corp., New York, has acquired **Computer Processing Unlimited, Inc.**, Chicago. The terms were not disclosed.

**KDI Corp.**, Cincinnati, Ohio, has reached an agreement in principle to acquire **Anacomp, Inc.**, Indianapolis, Ind. Under terms of the agreement, for each share of Anacomp stock, KDI will give either 28/100 of a share of KDI common stock, or 58 of KDI common stock, whichever is greater; or 213/1000 of a share of KDI common stock plus possible additional consideration, depending upon Anacomp earnings over a five-year period beginning with the consummation of the acquisition. KDI is an international company serving the electronics and computer industries, aerospace and defense programs, environmental sciences market, education, and physical recreation. Anacomp is a consulting firm dealing with computer sciences, education, financial management, urban analysis, and systems sciences.

**Groatie, Inc.**, Princeton, N.J., a company providing computerized demographic services for advertising, marketing, market research, and magazine reader response, has agreed to acquire the business and assets of **National Compu-Graphix, Inc.**, Jenkintown, Pa., a privately owned designer and distributor of computer forms and supplies. Terms of the agreement call for National Compu-Graphix to be acquired for an undisclosed amount of Groatie common stock and a future earnings payout in stock.

**Photo Magnetic Systems, Inc.**, Beltsville, Md., has announced a series of planned acquisitions. The companies acquired are: **The Multiple Science Corp.**, Asbury Park, N.J., and its wholly owned subsidiaries, **Universal Programming & Systems, Inc.**, Bethesda, Md., and **Commercial Computer & Mailing Services, Inc.**, a District of Columbia corporation. These companies will provide an IBM 360/30 with a talking Comput-a-phone to permit Photo Magnetic Systems,

Inc., through its franchised companies, **Comput-A-Credit**, of D.C., Inc., and **Computer Telephonic Co.**, of D.C., Inc., to offer communication oriented, computer-based services at reasonable prices to the consumer public and the small business man.

**Computer Exchange, Inc.**, New York, has begun talks that may lead to its acquisition of **Capital Corporate Resources, Inc.**, a holding company headquartered in Philadelphia.

## 3i Forms Data Bank Service Subsidiary

**PHILADELPHIA**—The 3i Co. Information Interscience Inc., Philadelphia, has formed a new and wholly owned company, **Excerpta Medica Information Systems, Inc.**

The new company is the result of an agreement between 3i Co. and Excerpta Medica Foundation of Amsterdam.

The result of the agreement will be the operation and marketing in the U.S. of Excerpta Medica's computerized information and data bank services, including the Excerpta Medica au-

### New Subsidiaries

tomated storage and retrieval program of medical information.

In addition, the company will operate and market a drug literature computer service developed by Excerpta Medica of Amsterdam.

Each year, abstracts and references from over 300,000 individual biomedical articles are stored in the data banks, representing the largest bio-medical information data base in the world

available commercially. The full range of services based on the new data bank will be operational early in the first quarter of 1970.

The Drug Literature Computer Services (Drugdoc) is designed especially to meet the information needs of pharmaceutical-industrial companies. Drugdoc provides highly specific medical and chemical information derived from international biomedical literature on all experimental and marketed drugs, and chemical compounds.

## If you've been wanting someone to build a low-cost digital tape drive with Hewlett-Packard quality, HP just did.

We've taken the OEM experience we've gained from putting almost 4000 digital tape systems in the field. Added what you've told us you'd like to see in a low-cost tape drive for small computers and off-line applications. And produced the HP 7970.

It has all the features you're looking for in a digital transport: IBM and ASCII compatibility, 25 ips speed without program restrictions, DTL/ITL compatible interface. Seven or eight track capability with simple field conversion. Standard 10 1/2 inch reels. Plus handsome appearance, fingertip push-

button controls, backlit indicators for quick operational status checks, dual gap head for read-after-write error checking capability.

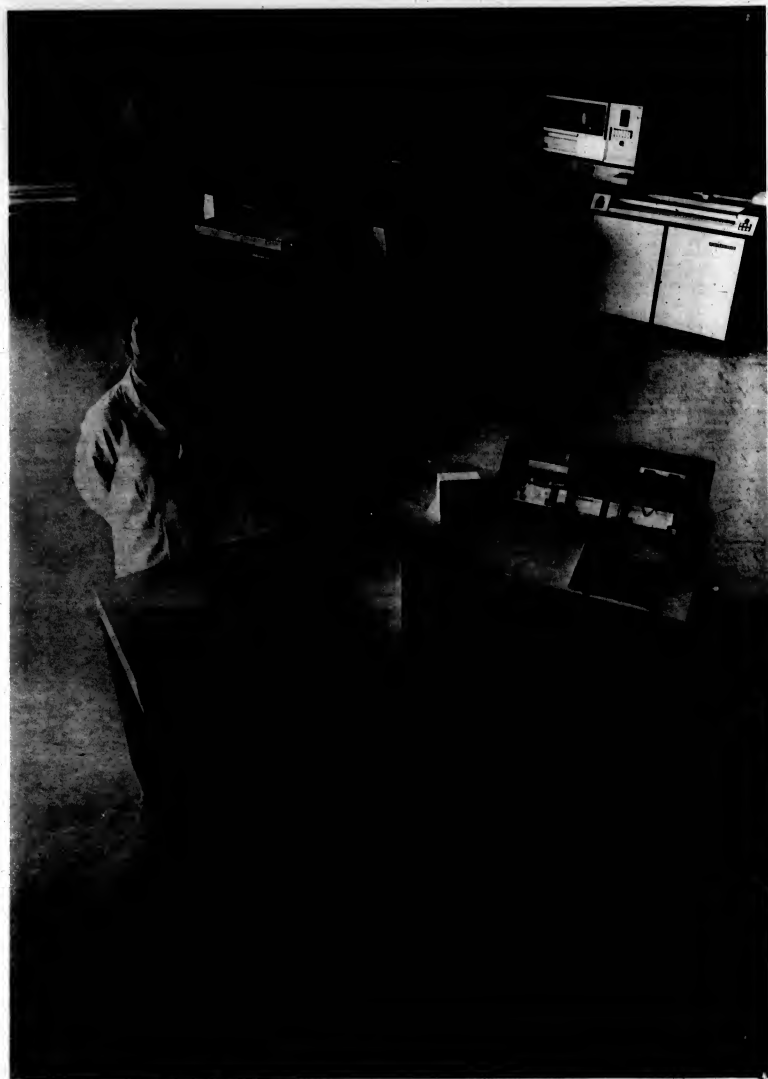
It also has HP's exclusive trouble-free design and rugged construction, with cast aluminum frame, automatically milled to precise reference planes. The tape transport components are mounted to this frame on precisely indexed bosses to assure tape path tolerances are routine. The HP 7970 also has electronic deskewing, direct drive motors, single capstan, and dynamic braking that eliminates mechanical adjustments. Plus

the back-up capability of 141 Hewlett-Packard sales and service offices around the world.

So if you want a low cost digital tape drive with HP quality, call your Hewlett-Packard field engineer for more information on our new 7970. Or write Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

**HEWLETT  PACKARD**  
MAGNETIC RECORDERS





## CalComp finally steps out of line.

For years, friends of our CalComp plotters have been waiting for CalComp to make something else.

Well, friends, this is the day you've been waiting for.

Now CalComp brings you, in addition to the world's leading computer graphics systems, two major new product lines:

Disk drives.

And Punchmaster.

And we think you'll be pleased about both.

**Our disk drives work twice as fast. For about half as much.**

CalComp's first disk drive is called the CD-1. And it's available today.

Thanks to a special electromagnetic detent and positioner, the 6-disk CD-1 affords several advantages over other disk drives.

Since it has no gears or hydraulics, the CD-1 gets by with fewer moving parts. For easier maintenance and unsurpassed reliability.

And because the CD-1 is utterly simple, it's a lot faster, too. With an average access time of just 30 milliseconds.

CalComp's first disk drive is also compatible with any IBM 360 system.

It stores 7.25 million bytes with easy conversion to higher capacities.

You can buy it for about half the price of comparable IBM equipment.

And you can lease it for less, too. With 7-day-per-week, 3-shift service included.

Of course, if our CD-1 interests you, so will our bigger CalComp CD-12/14, an 11-disk drive system available early in 1970.

With a CalComp controller and multiple units, the CD-12/14 offers an on-line capacity of up to 233 million bytes. And it's compatible with IBM 360 systems, too.

**Our Punchmaster makes three keypunch units work like four. Or more.**

Then there's the new CalComp Punchmaster, a buffered memory device (6K bits) that enables keypunch machines to accept data as fast as the fastest operator can key it.

And no keyed input system can do better than that.

What's more, a Punchmaster improves card format program capacity from 2 to 22. (Allowing any document to be punched or verified on just one pass.)

Its input buffer lets an operator keep keying at all times.

It handles constant data from memory. Reducing keystrokes sharply.

It offers an optional Batch Total

Accumulator. Eliminating many verification and balancing runs.

And it does all these things without changing your present computer system.

Today, these new products from CalComp are available in six metropolitan areas:

New York (212) 838-0402.

Washington, D.C. (202) 223-2920.

Chicago (312) 631-8492.

Dallas (214) 637-0040.

Houston (713) 771-3821.

And Los Angeles (714) 774-9141.

Meanwhile, plotter customers will be pleased to hear we also have several new graphic output systems available. Plus important new application software.

And as always, you'll find CalComp plotters, software support and service in 34 cities. So call or visit your CalComp man today.

He's lined up to see you.

**CALCOMP**

California Computer Products, Inc.  
Dept. W-1, 305 N. Muller Street  
Anaheim, California 92803.



## KEYPUNCHING

Starting at  
in N.Y.C.

\$3.00 PER HOUR  
OVERNIGHT SERVICE  
FAST TURNAROUND

INTEREX INC.

350 PARK AVE. 23rd FL.  
NEW YORK, N.Y. 10022  
(212) 636-1732

New from MetroData Systems, Inc.

### DL 620A, a complete 18-channel Digital Data Acquisition System for only \$3,900

The compact and lightweight design, plus low power requirements, makes the DL 620A an extremely versatile unit. Ideal for general purpose recording of analog or digital data on magnetic tape both in the laboratory and remote installations.

This unique digital recorder weighs only 18 lbs. and needs minimal power of 35 watts. Features include a presettable crystal controlled clock; ability to accept either analog or direct digital data; high Z differential analog input stage; selectable recording rates; carrier magnetic tape system with associated drive; plus all necessary logic and power supplies. Data recovery options include: tape-to-tape, tape-to-computer, and real-time. Write for complete story on the Model DL 620A and associated equipment.

metrodata systems, inc.

P. O. Box 1207, Norman, Oklahoma 73069



## OS USERS SAVE AT EPG

### CONFIGURATION

- 360/50 - 512K
- 8 - 9 Track tape drives
- 2 - 7 Track tape drives
- 1 - 2314 Direct Access Storage Device
- 6 - 2311 Disk Drives
- 2 - High Speed Printers
- 1 - 2540 Card/Read/Punch
- 1 - 2561 Card Reader
- 1 - 2701 Communications Control
- 1 - 2780 Terminal

### OS-MVT, MFT-II, HASP, RJE

Free: Operators  
Technical Support

Also: Systems & Programming  
80 Keypunch Machines  
360 Operations & Programming classes  
Sytems  
Remote Job entry capabilities

Call: TED SABARESE at (212) 826-0660  
Vice-President  
EPG Computer Centers Corporation  
345 Park Avenue  
New York, New York

## Orders and Installations

Delta Data Systems has sold two proprietary computer systems to Worthington Turbine International of Woburn, N.Y. The sale includes the Delta general ledger system and the Delta accounts payable system. Both systems cost \$10,000 when on sale to private users. When it is installed in Jan., 1970, the accounts payable system will provide input directly to the general ledger.

A \$700,000 contract has been received by Gerber Scientific Instrument Co. of South Windsor, Conn., from Fiat of Turin, Italy. The automotive and aircraft divisions of Fiat purchased similar Gerber 1075s; both are equipped with automatic line followers. The 2075s consist of a Series 2000 stored program computer control and Model 75 drafting table.

A real-time computer system using an ICL 4-70 central processing unit will be in operation early in the new year at Vehicle & General Insurance Co. The new system from International Computer Ltd. of London will give the company instant access from branch offices to a central file giving the current status of all their policies.

A \$304,352 order comprising two communications processors and related accessories and peripherals, special software development, and maintenance has been received by Comtec Inc., Rockville, Md., from Optimum Systems Inc. of Palo Alto, Calif. The addition of the Comest 60 will enable Optimum Systems' computer center to communicate with the widest possible variety of remote terminal installations.

An inertial guidance test table has been delivered to the aerospace division of Honeywell Inc. at Minneapolis by the Becker systems division of Omega-Ilco. The multi-purpose inertial equipment test system is slated to be used by Honeywell initially by the design of the test components for an advanced satellite control system, although it will also be used for a variety of other rate and position control applications.

A Burroughs 8340 electronic data processing system valued at more than \$170,000 has been installed at the Brighton State Bank in Brighton, Mich. The system is now used primarily to handle demand deposit and proof-of-transit bookkeeping, and will later handle savings, mortgage processing, and the Christmas Club.

## Contracts

The automobile's contribution to air pollution will be studied by TRW Inc. of Redondo Beach, Calif., under a pair of research contracts totaling \$700,000 from the Coordinating Research Council on behalf of the auto and oil industries, and the U.S. Department of Health, Education and Welfare. With support from Scott Research Laboratories, Inc., TRW's systems group plans to develop improved inspection, maintenance and surveillance tools, and procedures for smog control devices.

An 11-year agreement has been signed by Boise Cascade Computing, Inc. and the California State Employees' Credit Union No. 1, at Sacramento, for an on-line/real-time data processing system. The credit union will be linked to the Boise, Idaho, computer utility on leased telephone lines so that immediate access to data can be provided for the credit union's transactions.

The Federal Aviation Administration has selected United Telecontrol Electronics, Inc., Ashbury Park, N.J., to develop improved modulation testing equipment for aircraft instrumentation landing systems. The new modulation meter will be designed to minimize the chance of operational error as well as to improve modulation measurement techniques.

An initial \$13,620 contract from the Urban Institute has been received by the Hendrickson Corp. of Washington, D.C. The contract, which will be implemented over a four-month period, calls for cost studies of various family assistance and income maintenance programs under development by the Administration, and their impact or effect on reducing national and regional poverty.

A \$222,361 contract for re-grading and renumbering portions of the existing U.S. telephone network in southern Japan has been awarded to the Nippon Electric Co., Ltd. of Tokyo by the Air Force Electronic Systems Division.

### NOTICE OF ADVERTISING RATE INCREASE

Because of increased circulation (up over 30%) in 12 months, and to meet increasing production and distribution costs, and to continue the improvement and expansion of our editorial and news coverage of the computer industry, we are announcing a rate increase effective January 1, 1970. The increase averages less than 20% over our current rates. This keeps CW the most cost effective medium in the industry, the most frequently read, and the most timely publication.

Contracts received by Computerworld prior to October 15, 1969, will be protected under existing rates for the duration of the contract. Contracts received between October 15, 1969, and December 31, 1969, will be billed under Rate Card No. 4 until Dec. 31, 1969, at which time they will transfer to Rate Card No. 5 and maintain their lineage rate basis.

### OPERATE IN REAL TIME

If you're an executive in the \$12 billion computer industry, can you afford to wait a month or even a week for vital news that could help you to make an important decision or a quick move resulting in a major contract? The burgeoning EDP field is perhaps the most competitive in all of industry, with hundreds of new firms springing up weekly. Coming in second is coming in last!

COMPUTER DAILY - the industry's oldest daily newsletter - is the only practical way to avoid the dangerous "information lag." Published daily in Washington by men with years of familiarity with the industry and government, and backed by a staff of correspondents in the U.S. and Europe, *Computer Daily* is your day-to-day situation map of the EDP field, with complete, concise, and interpretive coverage of company news, new products, mergers and acquisitions, financial and SEC news, personnel appointments, etc., plus on-the-spot coverage of Congress, the White House, the Federal agencies and the military.

COMPUTER DAILY is delivered every working day of the year by first class or air mail. The complete service package includes detailed quarterly indexes, special supplements, and a high-quality binder for handy finger-print reference. To subscribe, fill out the coupon below:

COMPUTER DAILY  
Suite 3115 Dupont Circle Building  
1346 Connecticut Ave., N.W.  
Washington, D.C. 20036

Please enter my subscription to Computer Daily at:

☐ \$240 for one year ☐ \$140 for six months ☐ \$75 for three months

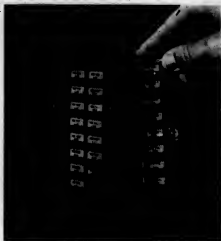
☐ Bill me ☐ Payment enclosed

SPECIAL OFFER: SEND PAYMENT WITH YOUR ORDER AND RECEIVE AN EXTRA MONTH'S ISSUES FOR THE PRICE OF A ONE-YEAR SUBSCRIPTION

Name \_\_\_\_\_ Title \_\_\_\_\_  
Organization \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



# 15 nano-second memory...



## there's a lot behind it

For one year we have been quietly mobilizing the industry's most capable semiconductor memory team. Personnel from all disciplines to design, assemble, test and volume produce the fastest, most reliable memory systems. Here are the results:

1. Our memories are the world's fastest — 15 nsec. access and 10 nsec. cycle times.
2. Our designs are pre-evaluated and optimized by computer simulation.
3. Our chips are individually packaged in proven, low-cost, ceramic Dual-In-Line packages and mounted on standard P/C cards.
4. Our cards are fully functional and incorporate our own logic support circuits to enhance system performance and minimize overhead circuit requirements.
5. Our quality is verified every step of the way by computerized testing that performs up to 5000 tests/sec. on the chip, the packaged devices, and the modular assemblies.
6. We are now in production.

We design our memories to be modularly expandable and we supply them in ECL and TTL compatible configurations. Our products reflect total capability...

The kind of capability that puts a lot behind us, including the competition.

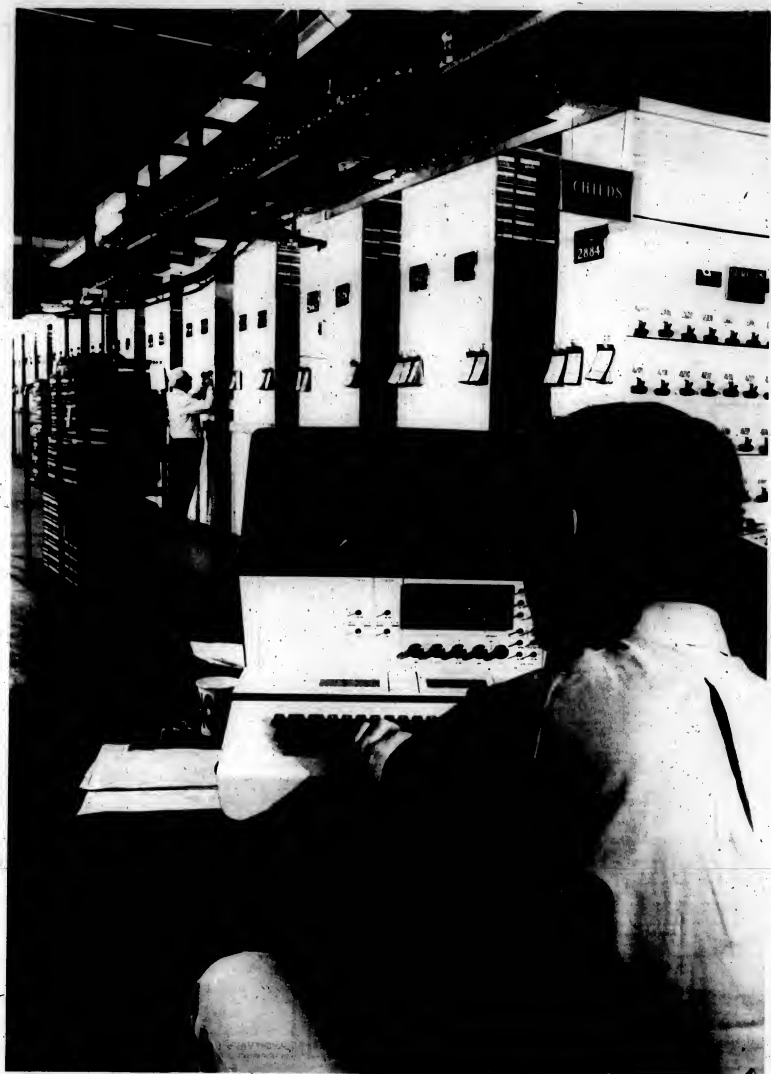
Our first series of modular cards is now available. To order:

	Prices (1 to 9)	ECL Compatible	TTL Compatible*
32 x 8	\$768.00	AMS 0328E	AMS 0328T
32 x 9	\$845.00	AMS 0329E	AMS 0329T

\*Delivery on TTL — one month.

# AMS

ADVANCED MEMORY SYSTEMS, INC., 1276 HAMMERWOOD AVE., SUNNYVALE, CALIF. 94086



# Your VIATRON installment purchase plan is better than aspirin for EDP financial headaches

Sure, money is tight; but VIATRON's installment payment agreement may let you have your cake and eat it too. Twenty-five per cent down and small monthly payments to suit your tight budget. Helping you make each dollar buy more is what VIATRON System 21 is all about.

\$468 down buys a ready-to-use System 21 data management station that lets any clerk prepare computer-compatible data on VIATAPE cartridges. \$1140 down buys a System 21 key-to-computer tape station with a fill-in-the-blanks video display that lets the

operator visually verify data. \$936 down buys a batch communications terminal with automatic turnaround. And only \$300 down buys a System 21 printing robot with complete formatting capabilities.

Your VIATRON dealer can show you how to live with your budget without sacrificing the capabilities you need. For the name of the VIATRON dealer nearest you, write VIATRON Computer Systems Corporation, Dept. C-18, Route 62, Bedford, Massachusetts 01730. Telephone (617) 275-6100.



VIATRON System 21 puts the logic where the problem is

## Position Announcements

### SYSTEMS ANALYSTS

Challenging position for an individual with a combination of extensive programming and systems design experience.

### SCIENTIFIC PROGRAMMERS

Openings available for individuals with a degree in mathematics and Fortran programming experience. Simulation and linear programming experience desired.

As the nation's fastest growing air carrier, we wish to offer you the opportunity to share in our unlimited growth potential. Salary commensurate with experience. Fringe benefits, including free air travel.

You are invited to submit a resume, including salary requirements, to:

Manager of Employment - Airline.

NORTHWEST ORIENT AIRLINES, INC.

Minneapolis/St. Paul Int'l Airport

St. Paul, Minnesota 55111

An Equal Opportunity Employer



## New England Career Opportunities Are Our Only Business

### INSTRUCTOR - SOFTWARE TESTER

10.5-14 K

This blue chip client company urgently needs an individual with a proven record in hardware/software instructing. Assembler language or machine language should be known. This person will instruct all levels part of the day, and will use his assembly language to test newly developed software. Your career path will depend on which group you like best.

### O/S PROGRAMMER ANALYST

11-14 K

This 360/80 512K OS MFT environment is going 7/11 Jan. of 1970. To qualify a person must have heavy D.O.S. experience, if not Direct O.S. exposure. Language background must be either Cobol or BASIC, but only 20% of the time would be programming. Systems design experience should be minimum of 2 years.

### SENIOR SCIENTIFIC PROGRAMMER

10-16 K

Excellent opportunity to be involved in key project responsibilities of digital and hybrid programming applications such as medical electronics, computer graphics, and simulation. Key qualifications: Machine language, object-oriented, and assembly language. Must be interested in approach to new systems, logic thinking, and math ability. Computer oriented, interested in hybrid simulation, familiar with diagnostics, experience with more than one programming/operating system, good communication of hardware/software tradeoffs.

### (3) BUSINESS PROGRAMMERS

10-13,000

Move up with this small but growing firm, located right here in greater Boston. They are offering the opportunity to get in on the ground floor. One year of Cobol, BAL, or PL/I and the desire & ability to move into systems analysis. Urgent need! Call now & make an early appointment.

### SYSTEM SOFTWARE DEVELOPER

11-15 K

Excellent opportunity for involvement in state-of-the-art programming development. Immediate recognition and rapid opportunity for growth and diversified applications. Will be responsible for software development projects, new programming, operating systems, and utility programs. Projects cover signal processing, graphics, and simulation techniques. Do you have two years of scientific programming experience, machine language experience, exposure to a creative environment, high level of deductive reasoning ability, good math ability, imagination.

### SENIOR PROGRAMMER/ANALYST

12-18 K

To perform analysis and design of computer software systems as related to microcomputers, data processing routines for small and large communications experience, S/360, B/360, or Q/360, and experience in an engineering environment.

## SEL Names Schwartz V.P. - Programming

FORT LAUDERDALE, Fla. - Systems Engineering Laboratories, Inc., has appointed Seymour D. Schwartz vice-president of programming.

In his new position, Schwartz is responsible for the planning, development, and maintenance of software systems which support

### Executive Corner

port the company's real-time computers and related equipment. He formerly was director of programming systems. Before joining the company in Feb. 1967, Schwartz was manager of project programming at Scientific Data Systems in El Segundo, Calif. During his 10 years in the computer industry, he has also held programming posts at Computer Sciences Corp. in El Segundo, Information Systems, Inc., in Los Angeles, and System Development Corp. in Santa Monica.

### CHIEF SYSTEMS ANALYST

to work in education and research. Masters Degree preferred. Starting salary commensurate with experience. Write:

Dr. F. Milan Johnson  
Computing Center  
East Carolina University  
Greenville, N.C. 27834

of Southern California.

Connolly Elected V.P. and Gen. Mgr. of CT/South

JACKSONVILLE, Fla. - CT/South Inc. has elected Fred Y. Connolly vice-president and general manager of the Florida division.

In his new position, Connolly will assume full responsibility for directing all marketing and operations activity throughout Florida.

Prior to joining CT/South, Connolly had a lengthy career with IBM where he served in numerous management positions during the last 14 years. His most recent position was branch manager in Concord, N.H. He also had served as marketing manager, marketing training instructor, and account representative.

Connolly received a B.S. in business administration from Ohio University, Athens.

CT provides professional computer management services to commercial, industrial, and governmental organizations throughout the U.S.

### Other Moves

Raymond W. Trish has been appointed vice-president of engineering and manufacturing for DSI Systems, Inc., Rockville, Md.

International General Electric Puerto Rico Inc. has appointed Marvin R. Broz manager of computer time-sharing sales in Puerto Rico.

Astrodats, Inc., Anaheim, Calif., has announced the following appointments: David F. Barnes to vice-president, and Robert B. Baker to the newly created position of executive vice-president; Barnes will continue as general manager of Astrodats's data services division. Baker continues as a member of the board of directors.

Control Data Corp., Minneapolis, has promoted Robert C. Olson to staff general manager, corporate quality assurance. He will supervise a staff which serves as a focal point for development, direction, and analysis of manufacturing plans dealing with all facets of quality assurance as they pertain to the manufacture of Control Data's products.

Communications Logic, Inc. of Houston, has named Jon H. Stuckert and George A. Mayfield vice-presidents.

David M. Collins has been appointed development manager at Remcom Systems, Inc., Dallas.

### TECHNIQUES PROGRAMMER

10.5-14.5 K

Will be responsible for formation of systems, D.S. & D.O.S. Study, device, improve, new & existing programs, help in software, instruct Programmers & Analyst on systems. Prepare dist. & proc. Profit sharing & bonus.

### OPERATIONS RESEARCH ANALYST 14

Blue chip company with a dynamic systems & programming background, needs a person with a background in applied math techniques. Knowledge of CRT's for work in an interactive systems group involved with management planning, linear programming, math models & financial decision making. MUST have FORTRAN & PL/I.

### SENIOR STAFF ANALYST

20-30 K

National Consulting firm is now searching for a Senior Staff Analyst to head up their software development department. Emphasis is on computer development & language expertise. The man will be a project leader doing technical support and customer interface. Education is open, experience is the key.

### B & L FINANCIAL CONSULTANTS

12-16 K

is B&L your bag? Locally based consulting firm with offices in the mid-west & west coast is looking for new talent to do consulting to financial institutions. If you are a people oriented team player, communications experience, S/360, B/360, or Q/360, and experience in an engineering environment.

### DIAGNOSTIC PROGRAMMERS

10-15 K

If you have done diagnostic (or would like to) and have a good solid hardware knowledge this Blue Chip Company would like to meet you. Experience in diagnostics is preferred but not necessary. You must be machine or Assembly Language.

### PROJECT LEADER

14-16 K

Our client urgently needs a project leader. Background should be B.O.M.P. cleared or inventory production control. Education requirements are open. But D.O.S. is a MUST. This company is not defense - non lay-off.

### ADVISOR

### SOFTWARE/HARDWARE

10.5-12 K

Corporate Headquarters of consumer service organization needs E.D.P. professional to join corporate staff. Perform studies, evaluations, make recommendations to executive management, prepare third generation computer communication and Software modifications necessary to create new management & information systems.

### SOFTWARE SPECIALIST

11-13 K

This position is for a B&L programmer who wants more. Our client company will train a B&L programmer with 1-2 years exp. to become a Software Specialist & earn 360/80 OS. This position also offers the opportunity to take charge of a new software systems group. No degree necessary.

### SYSTEMS DESIGN

12-17 K

Your ideas on job functions and job objectives are sought & acted upon. Urgent need for Synthesizing & Synthesizing with experience in systems or computer programming, scientific and/or business applications. Exciting work in systems software within the framework of a modified operation system.

EMPLOYERS PAY ALL FEES  
**SHAMROCK**

P.E.R.S.O.N.N.E.L.  
19th Floor Prudential Center  
Boston, Massachusetts 02199  
(617) 262-5600

## DON'T WAIT - DO IT NOW!

IF YOU CAN'T COME IN OR CALL 262-5600, FILL THIS OUT AND MAIL IT... WE'LL CALL YOU. ALL CONFIDENTIAL.

### Check your specialty:

EDP Management ☐  
Programming Mgmt. ☐  
Systems Management ☐  
Systems Consulting ☐  
Advanced Systems ☐  
Advanced Programming ☐  
Systems Design ☐  
Programming ☐  
Software ☐  
Hardware ☐

Name   
Street   
City  State   
Phone   
Best Time to Contact   
Salary

Send To:

SHAMROCK PERSONNEL  
19th Floor, PRUDENTIAL CENTER  
BOSTON, MASS. 02199

## Buy Sell Swap

### IBM EQUIPMENT

## Bought & Sold

Business Computers, Inc.  
10844 Shady Trail  
Dallas, Texas 75220  
(214) 358-0235

## CAREER OPPORTUNITIES

Major Bank - New York City, Excellent Fringe Benefits - Outstanding Pension Plan. Good Opportunity for Promotion to Officer Positions.

### PROGRAM MANAGER to \$17,000

Experience in Design of Real Time Systems.

### PROGRAMMERS \$10-14,000

Minimum 1 Year Experience - S/360

Knowledge Cobol.

### AIRLINE - NEW YORK CITY

Excellent Fringe Benefits & Travel Plan.

### CONSULTANT to \$17,000

Evaluation of Computer Equipment.

CONSULTANT to \$17,000

Evaluation of Operating Systems.

### MAJOR BLUE CHIP NYC CORPORATION

SYSTEMS PROGRAMMER to \$18,000

In Depth Knowledge OS 360.

Phone for Appointment:  
212-682-5440

Send resume in confidence to:  
Mr. James Steffas  
Steffas Associates  
Consultants to Management  
Suite 303 East  
Pan Am Building  
New York, New York 10017

## Buy Sell Swap

### WANTED FOR LEASE OR SUBLEASE

IBM 360-40's,  
12K and 256K  
City Box 3142  
60 Austin St.  
Newton, Mass.  
(617) 551

### IBM EDP EQUIPMENT

BOUGHT AND SOLD  
WE REMANUFACTURE  
AND REFURBISH EDP  
EQUIPMENT AT OUR  
OWN PLANT.

### comptrail CORPORATION

100 HIGHLAND PARKWAY  
ROSELLE, N.J. 07068  
(201) 261-2720

### FOR SALE

20 Brand New Teletypes  
ASR 33 Model TBE with  
X-on X-off \$1,000 each.  
Available for immediate  
delivery  
Call (301) 948-2446

### INSTANT EQUIPMENT

OR INSTANT EQUIPMENT  
We are the biggest buyer and seller  
of computer systems and punch  
card equipment.

### COMPUTER EXCHANGE

1000 N. 1st St., Suite 100, New York, N.Y. 10011  
(212) 673-0300

### NCR 390 System and Peripherals

361-1 paper tape reel reader  
386-1 magnetic ledger reader  
462-1 high speed tape punch  
417-1 tape splicer  
Contact: Ray Bornert  
814 West Rose Lane  
Phoenix, Arizona 85013  
602-265-3863

### COMPUTER LEASING

We are still buying  
IBM 360 Systems  
For Lease

### COMPUTER PLACEMENT INC.

55 New Montgomery Street  
San Francisco, Calif. 94105  
(415) 421-9571

## IBM EDP EQUIPMENT

Ready for immediate delivery  
Under IBM maintenance  
026 029 Key punches  
056 089 Verifiers  
7330 tape drivers, 1132 printer  
I.O.A. DATA CORP.  
363 Lafayette St.  
N.Y., N.Y. 10003  
(212) 673-0300 Ext 53

### IBM SALE

026-522000, 077-19900,  
082-510000, 083-540000,  
092-525000, 092-511000,  
093-510000, 097-547000,  
098-510000, 098-522000,  
099-511000, 099-522000,  
100-511000, 100-522000,  
101-511000, 101-522000,  
102-511000, 102-522000,  
103-511000, 103-522000,  
104-511000, 104-522000,  
105-511000, 105-522000,  
106-511000, 106-522000,  
107-511000, 107-522000,  
108-511000, 108-522000,  
109-511000, 109-522000,  
110-511000, 110-522000,  
111-511000, 111-522000,  
112-511000, 112-522000,  
113-511000, 113-522000,  
114-511000, 114-522000,  
115-511000, 115-522000,  
116-511000, 116-522000,  
117-511000, 117-522000,  
118-511000, 118-522000,  
119-511000, 119-522000,  
120-511000, 120-522000,  
121-511000, 121-522000,  
122-511000, 122-522000,  
123-511000, 123-522000,  
124-511000, 124-522000,  
125-511000, 125-522000,  
126-511000, 126-522000,  
127-511000, 127-522000,  
128-511000, 128-522000,  
129-511000, 129-522000,  
130-511000, 130-522000,  
131-511000, 131-522000,  
132-511000, 132-522000,  
133-511000, 133-522000,  
134-511000, 134-522000,  
135-511000, 135-522000,  
136-511000, 136-522000,  
137-511000, 137-522000,  
138-511000, 138-522000,  
139-511000, 139-522000,  
140-511000, 140-522000,  
141-511000, 141-522000,  
142-511000, 142-522000,  
143-511000, 143-522000,  
144-511000, 144-522000,  
145-511000, 145-522000,  
146-511000, 146-522000,  
147-511000, 147-522000,  
148-511000, 148-522000,  
149-511000, 149-522000,  
150-511000, 150-522000,  
151-511000, 151-522000,  
152-511000, 152-522000,  
153-511000, 153-522000,  
154-511000, 154-522000,  
155-511000, 155-522000,  
156-511000, 156-522000,  
157-511000, 157-522000,  
158-511000, 158-522000,  
159-511000, 159-522000,  
160-511000, 160-522000,  
161-511000, 161-522000,  
162-511000, 162-522000,  
163-511000, 163-522000,  
164-511000, 164-522000,  
165-511000, 165-522000,  
166-511000, 166-522000,  
167-511000, 167-522000,  
168-511000, 168-522000,  
169-511000, 169-522000,  
170-511000, 170-522000,  
171-511000, 171-522000,  
172-511000, 172-522000,  
173-511000, 173-522000,  
174-511000, 174-522000,  
175-511000, 175-522000,  
176-511000, 176-522000,  
177-511000, 177-522000,  
178-511000, 178-522000,  
179-511000, 179-522000,  
180-511000, 180-522000,  
181-511000, 181-522000,  
182-511000, 182-522000,  
183-511000, 183-522000,  
184-511000, 184-522000,  
185-511000, 185-522000,  
186-511000, 186-522000,  
187-511000, 187-522000,  
188-511000, 188-522000,  
189-511000, 189-522000,  
190-511000, 190-522000,  
191-511000, 191-522000,  
192-511000, 192-522000,  
193-511000, 193-522000,  
194-511000, 194-522000,  
195-511000, 195-522000,  
196-511000, 196-522000,  
197-511000, 197-522000,  
198-511000, 198-522000,  
199-511000, 199-522000,  
200-511000, 200-522000,  
201-511000, 201-522000,  
202-511000, 202-522000,  
203-511000, 203-522000,  
204-511000, 204-522000,  
205-511000, 205-522000,  
206-511000, 206-522000,  
207-511000, 207-522000,  
208-511000, 208-522000,  
209-511000, 209-522000,  
210-511000, 210-522000,  
211-511000, 211-522000,  
212-511000, 212-522000,  
213-511000, 213-522000,  
214-511000, 214-522000,  
215-511000, 215-522000,  
216-511000, 216-522000,  
217-511000, 217-522000,  
218-511000, 218-522000,  
219-511000, 219-522000,  
220-511000, 220-522000,  
221-511000, 221-522000,  
222-511000, 222-522000,  
223-511000, 223-522000,  
224-511000, 224-522000,  
225-511000, 225-522000,  
226-511000, 226-522000,  
227-511000, 227-522000,  
228-511000, 228-522000,  
229-511000, 229-522000,  
230-511000, 230-522000,  
231-511000, 231-522000,  
232-511000, 232-522000,  
233-511000, 233-522000,  
234-511000, 234-522000,  
235-511000, 235-522000,  
236-511000, 236-522000,  
237-511000, 237-522000,  
238-511000, 238-522000,  
239-511000, 239-522000,  
240-511000, 240-522000,  
241-511000, 241-522000,  
242-511000, 242-522000,  
243-511000, 243-522000,  
244-511000, 244-522000,  
245-511000, 245-522000,  
246-511000, 246-522000,  
247-511000, 247-522000,  
248-511000, 248-522000,  
249-511000, 249-522000,  
250-511000, 250-522000,  
251-511000, 251-522000,  
252-511000, 252-522000,  
253-511000, 253-522000,  
254-511000, 254-522000,  
255-511000, 255-522000,  
256-511000, 256-522000,  
257-511000, 257-522000,  
258-511000, 258-522000,  
259-511000, 259-522000,  
260-511000, 260-522000,  
261-511000, 261-522000,  
262-511000, 262-522000,  
263-511000, 263-522000,  
264-511000, 264-522000,  
265-511000, 265-522000,  
266-511000, 266-522000,  
267-511000, 267-522000,  
268-511000, 268-522000,  
269-511000, 269-522000,  
270-511000, 270-522000,  
271-511000, 271-522000,  
272-511000, 272-522000,  
273-511000, 273-522000,  
274-511000, 274-522000,  
275-511000, 275-522000,  
276-511000, 276-522000,  
277-511000, 277-522000,  
278-511000, 278-522000,  
279-511000, 279-522000,  
280-511000, 280-522000,  
281-511000, 281-522000,  
282-511000, 282-522000,  
283-511000, 283-522000,  
284-511000, 284-522000,  
285-511000, 285-522000,  
286-511000, 286-522000,  
287-511000, 287-522000,  
288-511000, 288-522000,  
289-511000, 289-522000,  
290-511000, 290-522000,  
291-511000, 291-522000,  
292-511000, 292-522000,  
293-511000, 293-522000,  
294-511000, 294-522000,  
295-511000, 295-522000,  
296-511000, 296-522000,  
297-511000, 297-522000,  
298-511000, 298-522000,  
299-511000, 299-522000,  
300-511000, 300-522000,  
301-511000, 301-522000,  
302-511000, 302-522000,  
303-511000, 303-522000,  
304-511000, 304-522000,  
305-511000, 305-522000,  
306-511000, 306-522000,  
307-511000, 307-522000,  
308-511000, 308-522000,  
309-511000, 309-522000,  
310-511000, 310-522000,  
311-511000, 311-522000,  
312-511000, 312-522000,  
313-511000, 313-522000,  
314-511000, 314-522000,  
315-511000, 315-522000,  
316-511000, 316-522000,  
317-511000, 317-522000,  
318-511000, 318-522000,  
319-511000, 319-522000,  
320-511000, 320-522000,  
321-511000, 321-522000,  
322-511000, 322-522000,  
323-511000, 323-522000,  
324-511000, 324-522000,  
325-511000, 325-522000,  
326-511000, 326-522000,  
327-511000, 327-522000,  
328-511000, 328-522000,  
329-511000, 329-522000,  
330-511000, 330-522000,  
331-511000, 331-522000,  
332-511000, 332-522000,  
333-511000, 333-522000,  
334-511000, 334-522000,  
335-511000, 335-522000,  
336-511000, 336-522000,  
337-511000, 337-522000,  
338-511000, 338-522000,  
339-511000, 339-522000,  
340-511000, 340-522000,  
341-511000, 341-522000,  
342-511000, 342-522000,  
343-511000, 343-522000,  
344-511000, 344-522000,  
345-511000, 345-522000,  
346-511000, 346-522000,  
347-511000, 347-522000,  
348-511000, 348-522000,  
349-511000, 349-522000,  
350-511000, 350-522000,  
351-511000, 351-522000,  
352-511000, 352-522000,  
353-511000, 353-522000,  
354-511000, 354-522000,  
355-511000, 355-522000,  
356-511000, 356-522000,  
357-511000, 357-522000,  
358-511000, 358-522000,  
359-511000, 359-522000,  
360-511000, 360-522000,  
361-511000, 361-522000,  
362-511000, 362-522000,  
363-511000, 363-522000,  
364-511000, 364-522000,  
365-511000, 365-522000,  
366-511000, 366-522000,  
367-511000, 367-522000,  
368-511000, 368-522000,  
369-511000, 369-522000,  
370-511000, 370-522000,  
371-511000, 371-522000,  
372-511000, 372-522000,  
373-511000, 373-522000,  
374-511000, 374-522000,  
375-511000, 375-522000,  
376-511000, 376-522000,  
377-511000, 377-522000,  
378-511000, 378-522000,  
379-511000, 379-522000,  
380-511000, 380-522000,  
381-511000, 381-522000,  
382-511000, 382-522000,  
383-511000, 383-522000,  
384-511000, 384-522000,  
385-511000, 385-522000,  
386-511000, 386-522000,  
387-511000, 387-522000,  
388-511000, 388-522000,  
389-511000, 389-522000,  
390-511000, 390-522000,  
391-511000, 391-522000,  
392-511000, 392-522000,  
393-511000, 393-522000,  
394-511000, 394-522000,  
395-511000, 395-522000,  
396-511000, 396-522000,  
397-511000, 397-522000,  
398-511000, 398-522000,  
399-511000, 399-522000,  
400-511000, 400-522000,  
401-511000, 401-522000,  
402-511000, 402-522000,  
403-511000, 403-522000,  
404-511000, 404-522000,  
405-511000, 405-522000,  
406-511000, 406-522000,  
407-511000, 407-522000,  
408-511000, 408-522000,  
409-511000, 409-522000,  
410-511000, 410-522000,  
411-511000, 411-522000,  
412-511000, 412-522000,  
413-511000, 413-522000,  
414-511000, 414-522000,  
415-511000, 415-522000,  
416-511000, 416-522000,  
417-511000, 417-522000,  
418-511000, 418-522000,  
419-511000, 419-522000,  
420-511000, 420-522000,  
421-511000, 421-522000,  
422-511000, 422-522000,  
423-511000, 423-522000,  
424-511000, 424-522000,  
425-511000, 425-522000,  
426-511000, 426-522000,  
427-511000, 427-522000,  
428-511000, 428-522000,  
429-511000, 429-522000,  
430-511000, 430-522000,  
431-511000, 431-522000,  
432-511000, 432-522000,  
433-511000, 433-522000,  
434-511000, 434-522000,  
435-511000, 435-522000,  
436-511000, 436-522000,  
437-511000, 437-522000,  
438-511000, 438-522000,  
439-511000, 439-522000,  
440-511000, 440-522000,  
441-511000, 441-522000,  
442-511000, 442-522000,  
443-511000, 443-522000,  
444-511000, 444-522000,  
445-511000, 445-522000,  
446-511000, 446-522000,  
447-511000, 447-522000,  
448-511000, 448-522000,  
449-511000, 449-522000,  
450-511000, 450-522000,  
451-511000, 451-522000,  
452-511000, 452-522000,  
453-511000, 453-522000,  
454-511000, 454-522000,  
455-511000, 455-522000,  
456-511000, 456-522000,  
457-511000, 457-522000,  
458-511000, 458-522000,  
459-511000, 459-522000,  
460-511000, 460-522000,  
461-511000, 461-522000,  
462-511000, 462-522000,  
463-511000, 463-522000,  
464-511000, 464-522000,  
465-511000, 465-522000,  
466-511000, 466-522000,  
467-511000, 467-522000,  
468-511000, 468-522000,  
469-511000, 469-522000,  
470-511000, 470-522000,  
471-511000, 471-522000,  
472-511000, 472-522000,  
473-511000, 473-522000,  
474-511000, 474-522000,  
475-511000, 475-522000,  
476-511000, 476-522000,  
477-511000, 477-522000,  
478-511000, 478-522000,  
479-511000, 479-522000,  
480-511000, 480-522000,  
481-511000, 481-522000,  
482-511000, 482-522000,  
483-511000, 483-522000,  
484-511000, 484-522000,  
485-511000, 485-522000,  
486-511000, 486-522000,  
487-511000, 487-522000,  
488-511000, 488-522000,  
489-511000, 489-522000,  
490-511000, 490-5220

## Time for Sale

### MASSACHUSETTS

DDP-516 32K

\$60/hr.

CALCOMP 763 PLOTTER

\$40/hr.

MULTI-LOGIC CORPORATION

179 Bedford St. Lexington, Mass.

Tel. (617) 862-8355

### COMPUTER SERVICE

2 IBM 360/30's

3 Shifts Per Day

7 Days A Week

Convenient, Full Service, Down-

town Boston Location Offering:

• 55K Bolt 30's, All Features

• 500K Tape, 7 &amp; 8 Track

• 32311 OHL

• Selection, 1 Multiplier, 1

• 1400 Series Compatibility

• Keypunches, Verifiers

• Full S.A.M. Support Equipment

• Office, Storage, Telephones

• Coffee, Complete Facilities

• Supplies and Systems

• Emergency Services

• Free Shipping To Your Needs

• Data Tailored To Your Needs

• Descriptive Brochure

on Request

Call Bob Brown, Dave Cox or

Herb Levine at 617-423-6250

24 Hours A Day

MASSACHUSETTS

CORPORATION

331 Tremont Street

At Park Street Station

Boston, Mass. 02109

Low Cost Solutions to  
Keypunch Problems.  
Speed - Accuracy - Service

A self-oriented  
CO analysis  
and control system.

**CERDACS**

FOR THE BUSINESS OF THE FUTURE

WRITE OR  
CALL SUITE 700-42, FOX PAVILION  
JENKINTOWN, PA 19046  
215 266-2106

**HEY\*\*\***

Looking for  
software  
information?

For details

system information corporation  
Publications Department: DM-1  
116 W. 42nd St., N.Y., N.Y. 10019

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Prime Time 280/40 - 121K

6 tape (2 30K/1, 3 disk,

1403 N - 1, 886-110/hr

Contact Mr. Daugherty

Information Services Inc. Bakers

Park, Watbury, Mass. 02187

Phone (617) 235-7865

### ILLINOIS

IBM 360-40

1401 M40 Compatibility

OS DOS

New Purchasing-Programming

COMPUTING OF CHICAGO

205 West Jackson Blvd.

CHICAGO, ILL. 327 6524

360/65K

TAPE DISK

1401 - 1440 Under CS - 30

Open Time on all Shifts

Available Now without

Reservations

• Key Punch Service •

• Hourly or Contract Rates

Call Now - 312-896-4580

Advanced Data Processing

A Division of

Datronic Service Corp.

111 S. Washington

Park Ridge, Ill. 60068

Open 24 hrs a day

7 days a week

CHICAGO LOOP

Guaranteed Prime Time on all

FOUR systems

360/30 65K

360/40 131K

360/40 131K

IC-6000

with micro-programming

30 Tapes - 12 nine track, 8

disks - 2311, 7044/7094,

1401/1410/7010; DOS - OS.

VOLUME DISCOUNTS

DATANUMS

624 S. Michigan

Chicago, Ill. 60605

(312) 930-1323

## "INSTANT COBOL"

Its stunning simplicity requires no special training! Customers have paid for it in 2 months!

Produces complete, bug-free punched COBOL programs in 15 minutes that would require 6 hours just to write by hand!

Over 30 customers are using it and saving money in the following areas:

- Data base retrieval
- Report programs automatically lay out the report!
- File to file programs
- New programmer training

Operational on 360 DOS/OS, Burroughs, Honeywell, RCA

Write or call:

**B.T. Quirk, Co.**

28165 GREENFIELD

SOUTHFIELD,

MICHIGAN 48075

313-356-5924

## NEW 1970 PAYROLL

For 360-OS disc processing. Designed for MFT-II or MVT environment. All Tax link. Multi-division in one pass. Checks or vouchers in same pass. Generalized design.

Your price \$8000. \* ready to run.

\* Effective October 15, 1969

Price subject to change without notice.

BELOIT COMPUTER CENTER

BELOIT, WISCONSIN 53511

(608) 365-2206

## SOFTWARE FOR SALE

### 360-Test Data Generator

Testcube creates up to 99,999 records for tape, disk seg or IS with only several control cards. Random or Controlled Data. Automatic Increments/Decrements. Control totals, exception conditions. In operation for 12 months -

360/DOS Price \$1500

COMPUTER SERVICES CORP.

23225 Northwestern,

Southfield, Mich. 48075

(313) 444-9030

NOW AVAILABLE!

## Librarian

A New Proprietary Product

Free APPLIED DATA RESEARCH

for

SOURCE PROGRAM

RETRIEVAL AND

MAINTENANCE

The latest software development

in 360 program management,

operating under OS or DOS,

and requiring less than 20K of memory.

The 360 LIBRARIAN is an

indispensable tool to assist a

programmer in coping with the

numerous problems of source

program retrieval and maintenance.

The LIBRARIAN can update, store,

maintain, document and ex-

ecute any 360 source program.

Protective features built into the system reduce the

human error factor in program handling.

Computer-generated listings provide

hardcopy records of all modifications and reflect the

current status of any source program to extend management

control over large or small programming efforts.

In summary, the LIBRARIAN

will facilitate all aspects of source program

management and manipulation

easily, efficiently and economically.

For FREE User Manual and

further information, write or call:

APPLIED DATA RESEARCH, Inc.

Route 206 Center

Pricenton, New Jersey 08540

Tel. (609) 921-8550

## Software for Sale

### NEW 1969

## AUTOFLOW

In use over 900 INSTALLATIONS throughout the world

An automatic flowcharting, debugging and maintenance system that produces 2 dimensional detailed and high level flow charts and special listings directly from COBOL, FORTRAN, PL-1, and assembly language input.

AUTOFLOW also produces listings of syntax errors, logic errors, procedure division statement summary, data-name cross reference, label (or paragraph or statement number) cross reference index, alphanumeric label index.

Available for: IBM 360 systems, H-200 systems, Spectra 70 systems, IBM 1400 and 7090 systems.

Write for new 1969 literature, free demonstration and pricing information.



APPLIED DATA RESEARCH, INC.

Route 206 Center Pricenton, N.J. 08540

609-921-8550

\*Office in principal cities throughout the U.S.

\*Patent Pending

**CUTLAS**

WRITE OR CALL SUITE 700-42, FOX PAVILION, JENKINTOWN, PA 19046

**PROTEKCK**

You won't need a separate check protector operation if you have this program:

- Protect any kind of computer written check by converting numeric amount to a written statement to appear on face of the check.
- Uses only 3K.
- Relocatable Cobol module for 360 DOS or OS.
- Fully documented.
- Only \$100.00.

Quality Mills, Inc.

Data Processing Ser.

P.O. Box 1107

Mt. Airy, N.C. 27030

### PAYROLL PACKAGE

Multi-branch, hourly and salary, all state and local taxes, generates all corporate and government reports. Currently operational. Thoroughly documented in a clear cut manner. Available for IBM 360 and H-200.

Price \$6,000

### RETRIEVAL PACKAGE

Used by DP and non-DP personnel. Selects, computes, accumulates and prints data in report form. English language program written in 10-20 minutes. IBM 360. Price \$3,000.



### AUTOMATED INFORMATION SYSTEMS, INC.

1 Washington Street

Wellesley Hills, Mass. 02181

(617) 237-3680

BANKS

NEW YORK CITY

Times Square

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

SAV-A-MATIC

One Day Time-Response

Automated Systems

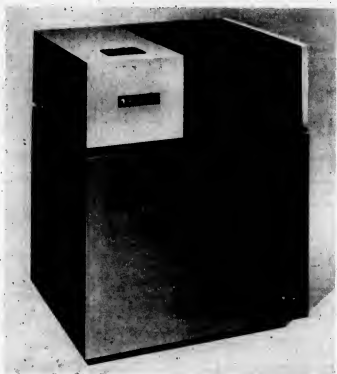
SAV-A-MATIC

One Day Time-Response

Automated Systems



# \$10,000 REWARD!



When you consider the fact that there are no premium charges for extra shift work on the Talcott 9311 Disc Drive, you can quickly calculate even greater savings than this on just a three-year lease. But that's just for one unit. In actual use, you can connect up to eight 9311's to one 2841 Control Unit. They can even be intermixed or directly interchanged with the 2311 or similar disc unit. Complete plug-to-plug compatibility. The Singer Company, Friden Division has engineered the 9311 to give greater reliability—with a unique

servomechanism instead of a hydraulic system. Now consider this: dependable service by the worldwide Friden Customer Service Organization; financial arrangements to give you maximum savings by Talcott Computer Leasing. Ready to "unbundle your 2311's"? Contact your local Friden office or write: Friden Division, The Singer Company, San Leandro, Calif. 94577.



## Talcott

**TALCOTT COMPUTER LEASING**

Division of James Talcott, Inc.

1290 Avenue of the Americas, New York, N. Y. 10019



Dec. 31, 1969 - Jan. 7, 1970

Page 41

## Databank Results Meet Predictions; Chairman Sees 33% Growth Rate

**NEW YORK**—Forecasting higher operating levels for 1970, the chairman of Databank, Inc. has reported that results for the year ended Dec. 31, 1969 are expected to meet earlier predictions. Chairman and Chief Executive Officer L. Steinhardt said that earnings, based on Databank's currently outstanding 591,000 shares, should be in the 15 cents to 20 cents per share range, with net income amounting to about \$75,000 to \$100,000, on revenues of about \$3.5 million to \$4 million in calendar 1969.

"Thereafter," he said, "we can expect Databank's sales to advance at a 33% growth rate, based on in-house budgeting. 1970 sales, therefore," he announced, "should exceed \$4.5 million with net income in the neighborhood of \$275,000 to \$325,000, equal to about 50 cents to 60 cents per share."

He admitted that earnings in calendar 1969 had been slowed somewhat, "but deliberately so," he said, by the merger of Tabulating & Data Processing, Inc. into Databank this past June. He described the merger as "a carefully calculated management move undertaken to acquire TDP's outstanding data processing product lines which ideally complement Databank's operations."

Steinhardt added that "TDP's excellent accounts receivable and low office analysis packages, if developed in-house by Databank, would have been far too costly and time-consuming to develop."

Therefore, the merger, which meant the absorption of TDP's first-half loss, was a logical and premeditated move and an investment in Databank's future growth."

He noted that TDP's margins are expected to improve considerably as the integration of the two companies progresses.

In calendar 1968, based on a pooling of the combined companies, Databank's net income amounted to \$173,549, or an adjusted 29 cents per share, on revenues of \$2.9 million.

## Time-Sharing Terminals Wins \$10 Million Credit

**WASHINGTON, D.C.**—Westinghouse Credit Corp., Pittsburgh, subsidiary of Westinghouse Electric Corp. and Time-Sharing Terminals Inc., Washington-headquartered computer data communications equipment and service company, have signed a three-year agreement providing Time-Sharing Terminals Inc. with a line of credit of up to \$10 million.

The credit line is subject to Westinghouse Credit Corp.'s continuing approval of the operations of the company, and other terms and conditions.

"Signing this agreement with Westinghouse Credit allows Time-Sharing Terminals to continue an aggressive equipment acquisition program during the coming year," said John C. Young, Time-Sharing Terminals president. "And the terms of the agreement permit us to use our equipment as secured debt with no dilution to the equity structure of the corporation."

Time-Sharing Terminals Inc., incorporated in November 1968, had a \$3.5 million public stock offering earlier this year. It operates offices in 13 major cities throughout the U.S., and provides national telecommunications service to the computer time-sharing and industrial communications industry.

The company works with more than 30 time-sharing companies.

### Firm Unaudited Net Doubles

**NEW YORK**—Fair Information Services, Inc.'s profit for the fiscal year ended Nov. 30, 1969 will be at least double that of 1968.

Robert Snoyer, Fair chairman and president revealed that "unaudited figures indicate a minimum profit of about 6-1/2 cents per share."

and their customers in the U.S. including University Computing Corp., ComShare, Inc., United Computing Systems Inc., Westinghouse and Applied Logic Corp. Time-Sharing Terminals also provides terminal service to computer users, requiring no computer data communications network, including such users as the Marriott Corp.

## Battelle Forecasts Slight Gain in U.S. R&D Spending

**COLUMBUS, Ohio**—Expenditures in 1970 for research and development in the U.S. are expected to total \$25.7 billion, according to the annual R&D forecast of the Columbus Laboratories of the Battelle Memorial Institute.

This would represent an increase of less than 1% over the total estimated for 1969; and industry, rather than the federal government, will be largely responsible for the modest increase that is expected. Because of increases in R&D costs, this could mean, in fact, a reduction of as much as 1% in the real level of R&D effort.

In terms of dollar value, roughly 15% of the computers sold in 1969 are, scientific, devoted to R&D effort.

Breaking down the estimate for calendar year 1970 by source of funds, the forecast sees the federal government spending \$15 billion; industry, about \$2.4 billion; colleges and universities, about \$922 million; and other not-for-profit institutions about \$408 million.

Federal R&D funds in 1970 are expected to be off by about \$200 million from the total for

## Brokers Sued for \$25 Million In Scientific Control Squabble

**DETROIT**—The latest reversion of Scientific Control Corp.'s bankruptcy is a \$25 million suit by a bank and a businessman against Merrill Lynch, Pierce, Fenner & Smith for allegedly recommending SEC.

The Bank of the Commonwealth and James Simon, a Dallas restaurateur, contend that they were "induced" to buy SEC through the "improper, irresponsible, misleading, deceptive, fraudulent and negligent statements, representations, and acts" of the world's largest brokerage house.

A Merrill Lynch spokesman replied that the suit was "ridiculous," and that they had "never handled transactions in the company's stock for the bank. We don't see how the bank has cause to sue us."

Scientific Control filed a Chapter XI bankruptcy petition Nov. 21. The Bank of the Commonwealth is one of its largest creditors.

### Class Action

The suit was filed as a class action on behalf of some 6,000 additional persons who allegedly "were similarly induced to purchase over 400,000 shares" or about 80% of SEC's common stock.

The suit says that during March 1968, the brokerage concern issued various recommendations for purchase of Scientific Control stock, and continued "recommending and influencing the

purchase" of the company's stock through both written and oral means through Oct. 17 of this year, and through oral means up to Dec. 16.

Yet, the suit claims, "on numerous occasions, beginning in March 1969, officers of Scientific informed certain employees and agents" of Merrill Lynch that Scientific Control was "in precarious financial condition." The suit also claims it was the "duty" of Merrill Lynch "to investigate into the financial condition of Scientific."

The Bank of the Commonwealth made loans of over \$2 million to SEC earlier this year. As part of the collateral for the

loans the bank received pledges of SEC common, SEC is currently selling in the \$5 range.

The bank asserted in its suit that in making the loans and in accepting the pledge of the Scientific Control stock it relied in part on recommendations of Merrill Lynch's "officers and agents" for the purchase of Scientific Control common, and in part on the market price of the stock, which at that time ranged from \$2.25 to \$3.4 a share. The suit claims "statements, advertisements, representations and acts" by Merrill Lynch representatives created "an artificial market" for Scientific Control common and inflated its value.

## Applied Data Research To Sell 1,000th Autoflow

**PRINCETON, N.J.**—Applied Data Research, Inc., computer software and service company, has sold its 1,000th Autoflow, according to Richard C. Jones, ADR president. The actual sale, he said, would take place later this month.

"This is a milestone in the computer software industry," Jones said. "We are the first company to have successfully produced and marketed this number of a single proprietary program."

Autoflow, an automated documentation and debugging system, produces accurate and standardized two-dimensional flowcharts and other aids for documentation and debugging.

The market for Autoflow is far from saturated, he said. There

are more than 20,000 computers—IBM 360, 1401, 7090 systems; H-200 systems and RCA Spectra systems—currently on the market that could use Autoflow.

"We believe that the continuing shortage of programmers means that more emphasis must be placed on ways to make data processing more efficient and economic. New computer systems will also require documentation programs which adds to Autoflow's future life," Jones added.

Autoflow is leased on a three-year basis at \$4,200 to \$16,000 depending on options selected.

Effective Jan. 1, 1970, there will be a 10% price increase, the first such increase since Autoflow was initially marketed.

## Shorts in EDP Stocks Up Slightly On New York, American Exchanges

**NEW YORK**—Short interest in computer stocks on the New York and American Stock Exchanges rose slightly in the month ended Dec. 15.

Short positions in 23 selected stocks on the Big Board gained 117,406 from 1,682,836 on Nov. 15 to 1,800,492.

The curb showed a similar small rise of 14,647, from 543,770 to 558,354.

The short interest is the number of shares not-repurchased for the lenders and represents a definite backlog of potential buy orders.

The seller generally anticipates a price drop that will enable him to repurchase an equal number of shares at a lower price.

The following tables show the New York and American exchange computer stocks in which a short position of at least 20,000 shares existed on Dec. 15, or in which there was a short position change of at least 10,000 shares since November.

N.Y. STOCK EXCHANGE	
Amer. Research	73,374 80,231
IBM	38,643 43,343
Bunker Ramo	30,795 32,351
Gen. Electric	14,538 15,552
Computer Sciences	25,383 123,188
Honeywell	22,338 23,640
Electronic Data	110,665 146,392
Memorex	25,185 18,837
Gen. Electric	26,461 21,670
Hewlett Packard	48,333 48,832
Honeywell	22,338 23,640
IBM	61,781 61,700
Sperry Rand	88,862 124,515
Gen. Electric	26,461 21,670
NEC	42,180 28,807
Planning Research	7,402 7,051
RCA	39,161 38,254
Sandier Assoc.	76,192 88,932
Honeywell	22,338 23,640
Scientific Data	27,043 27,869
Sperry Rand	129,514 165,201
University Comp.	110,338 71,846
Varian	15,578 86,827
Westinghouse	35,812 37,170

AMERICAN STOCK EXCHANGE	
Astrodata	35,327 28,852
Computer Inv.	28,550 29,640
DPF & G	89,849 71,589
Dynaflex	14,538 15,552
Digital Equip.	45,837 45,832
Electronic Data	110,665 146,392
Gen. Electric	26,461 21,670
IBM	61,781 61,700
Sperry Rand	129,514 165,201
University Comp.	110,338 71,846
Varian	15,578 86,827
Westinghouse	35,812 37,170

## Earnings Reports

### APPLIED MAGNETICS CORP.

Year Ended Sept. 30

	1969	1968
Shr Emd	\$ .78	\$ .57
Revenue	20,265,252	14,314,457
Earnings	1,535,511	1,084,501

e-Restated for acquisition of Dic

a-Related to acquisition of Dicon Electronics Inc. on a pooling-of-interest basis.

### CCI CORP.

Three Months Ended Oct. 31

	1969	1968
Shr Ernd.	\$ .05	\$ .21
Revenue	20,154,000	27,540,000
Earnings	340,000	886,000
a6 Mo		

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### GRAPHIC CONTROLS CORP.

Year Ended Sept. 30

	1969	1968
Shr Emd	\$11.10	\$1.11
Revenue	22,822,473	20,895,040
Spec Chg	917,470	893,657
Earnings	782,388	893,657

a-Based on income before special charge; b-From vacation of manufacturing operations; c-Equal to 95 cents a share.

### SEQUENTIAL INFORMATION SYS.

Year Ended July 31

	1969	1968
Revenue	1,414,403	1,694,626
Operating Loss	499,081	663,799

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

History prior to disposal, net of tax effect; b-Consisting of \$107,846, actual loss, on disposal of subsidiary and \$26,934 loss, on abandonment of land; c-Credit tax loss carry-forward; d-Income; e-Related to reflect the discontinuance of the business of Sequential Computer Corp., a wholly owned subsidiary.

### REYNOLDS & REYNOLDS

Year Ended Sept. 30

	1969*	1968
Shr Emd	\$1.27	\$1.13
Revenue	43,345,035	36,928,762
Earnings	2,872,613	2,541,190

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### HEWLETT-PACKARD CO.

Year Ended Oct. 31

	a1969	1968
Shr Emd	\$2.01	\$1.66
Revenue	324,000,000	268,849,000
Earnings	25,400,000	20,825,000

aPreliminary.

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### WYLE LABORATORIES

Three Months Ended Oct. 31

	1969	1968
Earnings	\$352,648	752,768
9 Mo	-	-
Shr Emd	\$ .29	\$ .55
Revenue	77,196,554	44,277,555
Spec Chg	6149,787	-
Earnings	\$1,665,902	\$1,857,180

a-Based on income before special credit; b-From liquidation of Vision Engineering-Burnell Co.; c-Equal to 10 cents a share in the quarter and 33 cents a share in the nine months; d-Adjusted for a two-for-one stock split in March 1969; e-Related to include acquisition on a pooling-of-interest basis.

### SANDERS ASSOCIATES INC.

Three Months Ended Oct. 31

Three Months Ended Oct. 3		
	1969	1968
Shr Emd	\$ .02	\$ .30
Revenue	38,385,000	43,422,000
Earnings	87,000	1,349,000

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### CYBERMATICS INC.

Six Months Ended Sept. 30

	1969	1968
Shr Ernd		
(Loss)	\$ .07	\$ .08
Revenue	571,277	104,149
Earnings		
(Loss)	42,753	(26,077)

This report is unaudited.

### DEARBORN COMPUT. & MARINE

Year Ended Oct. 31

	Year Ended Oct. 31	
	1969	1968
Shr Emd	\$2.10	\$
Revenue	38,473,008	10,613,000
Earnings	2,715,000	1,250,000

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### COMPUTER EQUIPMENT CORP.

Three Months Ended Sept. 27

	1969	1968
bShr Emd	\$ .08	\$ .12
Revenue	4,576,000	4,626,000
Tax Cred	49,000	11,000
cEarnings	208,000	281,000
b9 Mo		

a-Consists of common shares outstanding and common stock equivalents, assuming full conversion of the \$1.25 Series A preferred stock.

### FAIRBANKS MFG. CO.

Three Months Ended Sept. 30

Earnings	527,133	562,133
----------	---------	---------

a-Restated by company; b-Base income before tax credits; c-Equity

10 cents a share in the quarter and 13 cents a share in the nine months ended 1969, compared with 13 cents a share and 26 cents a share, respectively, in the like periods of 1968.

a-Based on income before special credit; b-Credit from tax loss carry-forward; c-Loss from devaluation of the French franc; d-Income, equal to five cents a share in the quarter and 12 cents a share in the nine months; e-Related to include acquisition on a pooling-of-interest basis.

### CTC COMPUTER CORP.

Three Months Ended Sept. 30

Shr Emd	7,871,000	7,395,000
Revenue		
Spec		
Items	c130,000	b78,000
Loss	324,000	d217,000
9 Mo		

a-Based on income before special credit; b-Credit from tax loss carry-forward; c-Loss from devaluation of the French franc; d-Income, equal to five cents a share in the quarter and 12 cents a share in the nine months; e-Related to include acquisition on a pooling-of-interest basis.

### AMPEX CORP.

Three Months Ended Nov. 1

a-Based on income before special credit; b-Credit from tax loss carryforwards; c-Loss; from devaluation of the French franc; d-Income; equivalent cents a share in the quarter ending March 31, 1969.

a-Based on income before special credit; b-Equal to 13 cents a share.

### DATA CONTROL SYSTEMS

Year Ended Sept. 30

Three Months Ended Sept. 30	
	1969
Revenue	1,706,975
Loss	163,596
9 Mo Rev	2,816,469

a-Based on income before special credit; b-Equal to 13 cents a share.

### GERBER SCIENTIFIC INSTR.

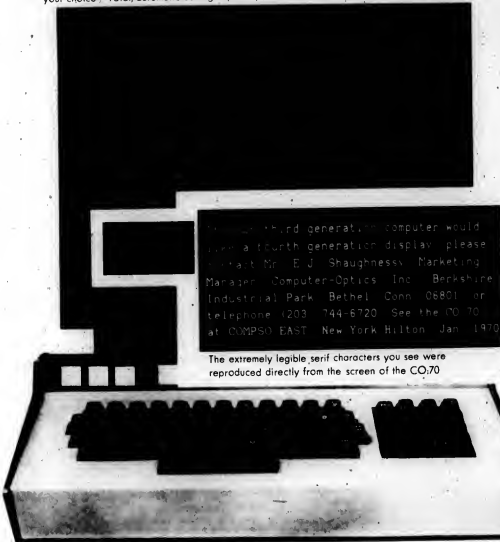
Six Months Ended Oct. 31

AMPEX CORP.		
Three Months Ended Nov. 30		
	1969	1968
Shr Emd	\$ .40	\$ .32
Revenue	80,711,000	73,900,000
Earnings	3,235,763	2,945,000

a-Based on weighted average shares outstanding, including common stock equivalents.

The CO-70.  
Simply the finest data display in the world.

3,000 characters / 100 characters per line / 30 lines per display / 88 character set / Full upper and lower case alphabet / Easy-to-read serif alphabets / Stand-alone / Interfaces to the CPU of your choice / Total, automatic editing capability / The CO-70 is the finest data display in the world.



The extremely legible serif characters you see were reproduced directly from the screen of the CO-70

Specialists in display systems  
**Computer Optics**



# WHY WE'VE TRAINED MEN FOR A VANISHING BUSINESS.

The unit record business is disappearing so fast it takes a service force of almost 1,000 men to keep our customers happy. There are over 6,000 customer installations, many of which run their punched card equipment day and night.

Here we are in this so-called defunct business and still we're working nights and weekends keeping up with the workload. The only thing that's vanished is the eight-hour day.

That's not all that surprising considering there are about 40,000 unit record installations in this country, with an estimated 600,000 pieces of punched card machines now in use.



With numbers like those you need a lot of well trained professionals in a lot of places. Which is why we can provide 24-hour service in more than 50 locations.

It would be nice to be in a business that wasn't always vanishing. But you get used to it. They first closed the book on the unit record business 15 years ago when IBM brought out the 650. Then came the 705. Now it's the System/3 and we are once again the Ghost of Data Processing Past.

Yet everywhere you look you see those familiar old tabs and sorters and calculators,

humming away, getting the work out. Unglamorous, uncomplicated, and inexpensive. So inexpensive, that it's possible, for the price of one hour's computer time, to rent a small unit record combination for a whole month.

A lot of people know this, and a lot of people take advantage of it to get more out of their computers,

and at great savings. Bog a computer down with a lot of raw data and you're likely to bog down your profit and loss statement as well.

Then there are things like computer editing and back-up. Not exactly the stuff of tomorrow's headlines, but not to be ignored either. Especially when the auditors are hanging around.

In the salons of technology they twitter about the new computers, and sometimes we do, too. But all those workaday calculating tasks keep piling up, problems in search of an economical solution: That's why all those punched card machines are still around. Along with all those well trained men to care for them. You need good men in a vanishing business.



- ☐ Please send me your new unit record brochure.  
☐ I would like to discuss my data processing needs.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**MAI** Equipment Corporation  
300 East 44th Street, New York, New York 10017